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# MOSAIC: A New Pain-Free Psychotherapy for Psychological Trauma

Stéphanie Khalfa, Ph.D., and Guillaume Poupard, Ph.D.

Eye movements and alternating stimuli for brain integration (MOSAIC) is a promising but untested new therapy. Its four-step protocol is based on the effects of bilateral alternating stimulation (BAS) (as in eye movement desensitization and reprocessing therapy) on the brain. This solution-oriented therapy promotes experiencing solutions through bodily sensations. Through BAS and bodily sensations, MOSAIC therapy aims to enrich the traumatic memory neuronal network with new information

so that the client's psychological trauma is no longer distressing. Thus, MOSAIC can be used to treat psychological trauma without the pain associated with reliving the traumatic situation. This method may be particularly adaptive for patients who have experienced complex trauma and who have dissociative experiences.

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Posttraumatic stress disorder (PTSD) is a major public health problem, with a lifetime prevalence of 8% to 11% (1), and is accompanied by comorbid conditions such as addiction and depression among more than 80% of patients. PTSD develops after direct or indirect exposure to one or more traumatic events and has four categories of symptoms: reliving of the event, avoidance of what may remind one of the event, persistent negative alterations in cognition and mood (e.g., sadness, anger, fear, feelings of danger, shame), and hyper-responsiveness (e.g., hypervigilance, startle response, irritability), according to *DSM-5* criteria (2). From 3 days to 1 month after exposure to the traumatic event, the diagnosis of acute stress disorder is considered; after 1 month, clinicians begin to consider a diagnosis of PTSD.

When the response to a traumatic event does not meet the criteria for acute stress disorder or when the exposure to a stressful event does not meet the criteria for exposure to a traumatic event, the condition is called adjustment disorder. According to *DSM-5* diagnostic criteria (2), adjustment disorder is characterized by the presence of emotional or behavioral symptoms in response to an identifiable stressor, as long as the symptoms do not meet the criteria for another disorder, such as acute stress disorder, PTSD, depression, or an anxiety disorder.

## BACKGROUND

Cognitive and behavioral therapies and eye movement desensitization and reprocessing (EMDR) therapy seem more effective than drug therapy in treating peritraumatic symptoms and are therefore recommended for treating PTSD (3). In three to eight 90-minute sessions, EMDR achieved rates of 77% to 90% remission of PTSD in seven of eight randomized

controlled trials of civilian populations with PTSD (4). Results appear to be stable at 35 months (5). EMDR is a standardized eight-step protocol that combines exposure to the cognitive, emotional, and physical aspects of the traumatic experience with the presentation of bilateral alternating stimuli (BAS), whether visual, tactile, or right-to-left anterior auditory stimuli (6). This reactivation of memory accompanied by eye movements or BAS allows for a rapid decrease in emotional responses caused by traumatic memory, and ultimately symptoms of PTSD, according to the neurobiological hypothesis of the reactivation of memory associated with BAS (6, 7).

## BILATERAL ALTERNATING STIMULI

The major therapeutic action of EMDR seems to involve the association between the memory of the trauma and BAS and results in a rapid extinction of the emotional responses evoked by the memory of the trauma (8). Research has been carried out to understand the effect of the BAS on brain activity, particularly during the extinction of fear. The first research on EMDR therapy in animals showed the relevance of focusing on BAS, because the fear responses could be modulated outside of any psychological action. Indeed, mice that underwent fear conditioning, with BAS performed during fear extinction, had fewer fear responses during the recall of fear extinction (10 days and even 60 days after fear conditioning) than did mice that had not received BAS during fear extinction (9). We reproduced these behavioral results among healthy humans whose learning of fear extinction was also facilitated by BAS (10).

A functional MRI study of the same protocol allowed us to demonstrate that when learning to extinguish fear, the

addition of auditory BAS activated not only the auditory cortex but also the medial frontal gyrus and precuneus (11). This BAS can also increase the functional connectivity between these three structures and the anterior cingulate cortex, lower frontal gyrus, insula, cerebellum, thalamus, and occipital cortex. Therefore, simple auditory stimuli (such as BAS) can modify a vast neuronal network of structures involved in memory, emotions, motor skills, self-awareness, and multisensory integration from the first minutes of fear extinction learning (11).

At this point in our research, we wondered how the involvement of this neural network could occur with BAS. We found an initial explanation with the stochastic resonance theory in physics: applying a stochastic signal (noise) to a device with nonlinearities, such as a neuron, improves its performance (12). This phenomenon allows for increased neural synchronization (13). BAS involves noises that have no precise signification for the brain; the noises are auditory stimuli of broadband noise and kinesthetic sensations through tapping. BAS adds information to neurons that were not activated but that become activated at the same time as those activated by traumatic memory recall in therapy. With BAS, new neuronal activations are elicited and can synchronize with the neuronal network of the traumatic memory and modify it. According to Hebbian theory (14), little by little, after a certain number of sessions with BAS, the brain's representation of the traumatic memory has become so different from the initial traumatic representation that the amygdala is no longer activated. The traumatic memory has reconsolidated itself in a form that is free of negative emotion revival (15).

This theory may explain how BAS in EMDR therapy can be efficient for remission of PTSD symptoms. One difficult aspect of EMDR is that patients must relive the pain of traumatic events, sometimes for several sessions. On the basis of our research on the biological effects of BAS and our understanding of how BAS acts at the cerebral level, and in trying to avoid focusing on the painful traumatic memory, we propose a new therapeutic approach that uses BAS but focuses on solution-oriented therapy and experiential therapy.

### **MOSAIC: A NEW THERAPEUTIC APPROACH**

In 1985, propelled by the impetus of de Shazer et al. (16), solution-oriented brief therapy (ST) was created. Instead of focusing on the problem to be solved, ST focuses on solutions, strengths, and resilience. In addition to exploring previous solutions to the patient's problem, ST explores behaviors that create exceptions to the problem and, through a series of interventions, encourages patients to perform more of these behaviors. ST posits that each individual has the necessary resources to resolve the problem (17). This therapy has been found effective in reducing depression and perceived stress among patients with breast cancer (18). After stroke, ST can also reduce symptoms of depression and anxiety and increase constructive attitudes and self-efficacy. More generally,

depressive and anxiety disorders are improved by ST, and ST is an effective treatment for psychosocial difficulties (17).

The experiential approach was created in the 1950s by Carl Rogers and Eugene Gendlin, with the idea that patients had to feel the problem in the body through a specific picture or words in order to feel relief, meaning, and movement (19). The act of experiencing is related to the sense of bodily feeling (i.e., emotions that have been viscerally and physiologically experienced). In experiential psychotherapy, attention is given to the present experience, helping clients to open to and embrace their experiences (20). This therapy works in the space of the encounter between explicit and implicit experiencing (20). Internal bodily sensations are also the focus of somatic experiencing therapy (21), which is used to treat chronic stress and PTSD. All of these psychotherapeutic techniques are part of a humanist and gestalt approach, as is *mouvements oculaires et stimulations alternées pour l'intégration cérébrale* (eye movements and alternating stimuli for brain integration) (MOSAIC) therapy.

MOSAIC, a new therapy, uses the effects of BAS on the brain (10). However, instead of being problem oriented as in EMDR therapy, this therapy promotes experiencing the solution through sensations (i.e., experiential solution therapy). On the basis of the neuronal model explaining the effect of BAS in psychotherapy, MOSAIC therapy seeks the appropriate resources (bodily sensations) within the patient so that the psychological trauma is no longer distressing. The neuronal network of the traumatic memory is enriched with this new information experienced in the body, as in the experiential and somatic approaches, and amplified by the BAS. Thus, MOSAIC therapy can be used to treat psychological trauma without the pain associated with reliving the traumatic situation, consequently avoiding vicarious trauma. Compared with EMDR therapy, MOSAIC therapy would be expected to have similar efficacy for PTSD without forcing patients to relive the pain of the psychological trauma. The theoretical foundations of MOSAIC are resolutely neurophysiological, on the basis of the assumption that the solution already exists in the body (through the sensations engraved in the patient's history). Therefore, patients need only to experience the sensorial solution and then activate neuronal connections between the neuronal network corresponding to bodily sensations associated with the solution and the network of neurons associated with the memory.

### **MOSAIC PROTOCOL**

MOSAIC therapy consists of a four-step protocol including a MOSAIC interview; a reconnection loop; experiencing of the therapy's benefits; and debriefing, posttalk (i.e., a conversation at the end of the protocol to warn of what may happen after the session), and sensory task prescriptions. Some of the questions used in the protocol are based on ST, and others have been created according to the model proposed above (i.e., experiential solution therapy).

**BOX 1. Recommendations for using MOSAIC therapy to treat psychological trauma<sup>a</sup>**

MOSAIC therapy is a promising treatment for acute stress disorders, adjustment disorders, and PTSD.

MOSAIC therapy enhances attention to bodily sensations by use of bilateral alternating stimuli, thereby modifying emotional and memory neuronal networks.

In lieu of reliving painful memories, in MOSAIC therapy patients focus on finding solutions.

MOSAIC therapy relies on a neurophysiological model.

A specific training protocol must be followed to practice MOSAIC therapy.

<sup>a</sup>MOSAIC, *mouvements oculaires et stimulations alternées pour l'intégration cérébrale* (eye movements and alternating stimuli for brain integration).

First, the MOSAIC interview is intended to define the objective by determining the client's problem, the disadvantage of changing, what has already been done to change, and what has worked, and finally, by assessing confidence in the therapy on a 10-point scale. The interview is also intended to define limiting targets, which may be described as situations in which the person's resources (cognitive, emotional, somatic, or behavioral functioning) are hindered and situations that are a source of suffering. The limiting target could, for example, be a traumatic event, a phobogenic situation, or a social difficulty. Then, the client experiences this situation in his or her body and assesses the intensity of the internal (bodily) limiting sensation on a 10-point scale. The sensation could be a knot in the belly or throat, chest tightness, or a feeling of paralysis. Finally, the patients' desired internal (bodily) sensation (DIS), a more optimal feeling in response to the limiting target, is defined. The client is asked what different feeling (other than the internal limiting sensation) he or she wants to experience to make the limiting sensation fairer for him or her. If necessary, to help the person feel this sensation fully, the therapist can help him or her recall a context in which he or she has already lived in order to make a gesture representative of this sensation. The therapist can amplify this feeling verbally by inductive language with the words, "Feel deeper, feel more, connect more, and let that feeling come over more."

The second step, the reconnection loop, is intended to reconnect the neural network between the DIS and the limiting target. At the onset, the client is asked to feel (i.e., be sensorially focused) and focus on the DIS in association with the BAS until the DIS is deeply experienced. Then, while the client is experiencing the DIS, he or she is instructed to rethink about the limiting target in association with the BAS. At this point, the therapist must verify how the client feels when reconnecting to the limiting target. If the sensations are comfortable, the therapist goes to the next step; otherwise, the same reconnection loop must be repeated with the uncomfortable sensation and the corresponding DIS in association with the BAS. To check how the client feels in relation to the limiting target, the therapist should ask how the client currently feels and whether the feeling is comfortable. If so, the therapist should ask the client to rate the intensity of this comfort on a scale from 0 to 10. If the comfortable sensation is at an intensity of  $\geq 7$ , the protocol is continued.

The third step of the protocol consists of experiencing the benefits of change in other contexts by interviewing the client about expected changes in the future because the limiting target is no longer a problem. All these changes will be experienced in association with the BAS. In this step, the client imagines what this new comfortable feeling related to the limiting target will allow in his or her life and experiences that change. The therapist will successively ask the following questions: "What will make it possible for you to live like this? In which areas of your life will these changes manifest themselves and how will they be manifested? What values will change? What could be more important?"

Finally, the fourth step consists of a debriefing, posttalk, and a sensory tasks prescription oriented on bodily sensations, which is what differentiates this therapy from ST. The client is asked about what was sensorially interesting in the psychotherapy session, what was useful, and what was learned. The client is warned about possible fatigue and emotional changes. At the end of the session, a homework assignment is given, as in ST. The most common example of a task assigned at the end of the protocol is to propose that the client "reopen" the desired internal sensation experienced during the therapy in a relaxed context to stabilize the sensation.

**IMPLICATIONS FOR CLINICAL PRACTICE**

MOSAIC, a promising new treatment, is being taught (<https://wayinside.fr/project/formation-mosaic>) and used in therapy. It now must undergo scientific validation through clinical trials.

The reference protocol for MOSAIC therapy presented in this article is intended for use in treating clients who have acute stress disorders, adjustment disorders, and PTSD (Box 1). The protocol is appropriate for all such patients, but the vocabulary should be adapted for use with children or patients with mental illness. Other MOSAIC protocols have been created specifically for clients with anxiety disorders, depression, and addiction and will be described in future articles.

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