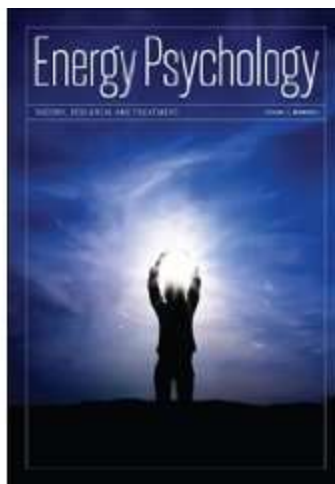


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Memory Reconsolidation and Energy Psychology

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A century of psychotherapy has demonstrated that being effective in helping clients change deep emotional learnings and longstanding behavioral patterns is not for the passive or merely good-hearted therapist. The steps that are required for the brain to update new learnings have been identified, and effective therapists and effective therapies—whether or not they are aware of it—insure that each step is accomplished (Ecker, Ticic, and Hulley, 2012).

The brain stores distressful experiences and, over time, revises emotional learnings that grew out of those experiences but that are no longer serving the person's adaptation or development. Two basic strategies for achieving this have naturally evolved. If situations that trigger the old learning repeatedly produce outcomes that are different from the outcome the old learning predicts, that learning will eventually be over-ridden with a new learning based on the more current experiences. You were bitten by a dog when you were four and have feared dogs ever since. Your best friend has a dog and you gradually let it nearer until you are able to play with it with no fear. Your comfort with your friend's dog generalizes to other dogs. This is called extinction. Exposure therapies model themselves after the brain's natural ability to extinguish old emotional learnings by overriding them with the lessons of more recent experiences.

A second way the brain revises outdated emotional learnings is called memory reconsolidation. Reconsolidation can occur much more quickly than extinction, and the new learnings are more durable than those based on extinction. For reconsolidation to occur, however, very precise conditions are required. The most effective therapies, whether deliberately or not, are attuned to the principles that are involved in reconsolidation (Ecker et al., 2012). This article shows that energy psychology protocols are not only attuned to these principles, but also that stimulating acupoints facilitates memory reconsolidation more rapidly and effectively than many of the other therapeutic approaches that are nonetheless also effective.

How the Brain Processes Disturbing Experiences

How does the brain store and revise emotional learning? Core beliefs and mental models formed in the presence of intense emotion during childhood or later “are locked into the brain by extraordinarily durable synapses” (Ecker et al., p. 3) that normally persist for the remainder of the person's life. Neuroscience research since 2004 has, however, demonstrated that—by

facilitating a specific sequence of experiences—it is possible to activate targeted emotional learnings and chemically unlock their synapses “for prompt dissolution of those retrieved learnings at their emotional and neural roots” (p. 8). Through this process of “depotentiating” (deactivating at the synaptic level) the neural pathways maintaining emotional learnings that are at the basis of psychological problems, “major, longstanding symptoms can cease [because] their very basis no longer exists” (p. 4). When synapses are temporarily unlocked during the precise set of conditions described below, neural pathways that sustain old emotional learnings may be altered or totally eradicated.

The key involves the way the brain first *consolidates* emotionally charged experiences (translating them into memory) and may then, after such experiences have been recalled, *reconsolidate* them (reintegrate retrieved memories into the memory system in a way that maintains or modifies the memory). Experiences become consolidated into working memory within seconds, and then into short-term memory within minutes to hours, through the synthesis of proteins that form synaptic pathways between neurons (“synaptic consolidation”), a hippocampus-mediated process. Over time they are further consolidated with other memories (“systems consolidation”), a process that involves the neo-cortex (Roediger, Dudai, & Fitzpatrick, 2007). Memories are formed by separate memory systems into two basic layers, implicit and explicit memories. Implicit memories do not involve conscious recall of an event. They are, rather, encoded as behavioral learnings, emotional reactions, perceptions of the outer world, and bodily sensations, as well as “generalizations across experiences, summarizing elements of lived moments into schema or mental models of events” (Siegel, 2010, p. 63). While implicit memories do not bring the earlier experience into conscious memory, they can impact current experiences without the person’s recognition of their influence. This can be useful. The implicit memory system, in fact, plays a central role in daily functioning, from navigating one’s way through repetitive choice points without having to seek a new solution each time, to routine procedures such as tying one’s shoes or driving a car. We don’t think about the steps or where we learned them. We simply do them, with our minds free to focus on other concerns.

Explicit memory involves the more familiar conscious recall of facts and events. First encoded by the hippocampus, memories of one’s experiences subsequently become integrated as autobiographical memory at the neocortical level. Compared with the emotional or procedural learnings in the implicit memory network, which are stored in the subcortical limbic system and right cortical hemisphere, explicit memory

is more flexible and gives us the factual scaffold of our understanding of the world as well as weaving a set of autobiographical puzzle piece assemblies. In other words, implicit memory provides the pieces; explicit memory assembles them into fuller pictures of the whole” (Siegel, 2010, p. 64).

But when a memory is based on trauma or other difficult experiences, this integration of the implicit and explicit memory systems may not occur.

Ecker et al. explain that implicit memories of highly charged emotional events may, in fact, “underlie and generate” a large proportion of the symptoms people present in psychotherapy (p. 14), including symptoms that are often attributed to genetic and other factors, such as many

forms of depression. They propose that the implicit memory system generates coherent mental models that “make deep sense in light of actual life experiences and are fully adaptive in how they embody the individual’s efforts to avoid harm and ensure well-being” (p. 7). Symptoms, they feel, are best understood as emerging from mental models that reflect “adaptive, coherent strivings” (p. 7) from an earlier time rather than in the pathologizing terms found in much of the clinical literature. However, when these models are imposed on new circumstances, they are often limiting or harmful and may become the source of a range of psychological difficulties.

The Cost of Unprocessed Memories

Implicit body-level memories and learnings can influence perceptions, thoughts, and behavior in ways that produce psychological symptoms or are otherwise costly to the person’s ability to thrive, and they tend to persist. If, however, the experience that evoked the implicit memory is paired with an experience that is in conflict with the person’s predominant mental models, the conflict may enter consciousness in ruminations, mental enactments of what might have been done or said differently, or in dream content. Sleeping and dreaming are among the ways the brain attempts to reconcile implicit memories with experiences that challenge them (Walker & van der Helm, 2009). Conscious and unconscious mental activities converge to make sense of unsettling experiences, to put them into perspective by comparing them with related experiences from the past, and to glean learnings that can be applied when similar situations are encountered.

Some experiences, however, overwhelm a person’s ability to integrate them with existing neural networks, and they are consolidated in the implicit memory system without subsequent integration by the neocortex. Traumatic experiences may actually be stored in fragments—as sensations, perceptions, emotions, thoughts, and impulses to react, such as to flee the situation—that can re-emerge and impact current perceptions and behavior with no conscious recognition of their origin. PTSD, stemming from intense trauma, has received the greatest attention, but many typical childhood or subsequent experiences—such as severe humiliation, betrayal, embarrassment, criticism, or a major loss or threat—can also create implicit memories and learnings that reactivate in the present and dominate information processing. Rather than being stored in the fragmentary manner seen in PTSD, these experiences tend to be coded in the implicit memory system as isolated but coherent internal schema for avoiding harm or adapting to difficult situations. Because they were formed to cope with circumstances that are usually no longer current, they may be at the root of automated, self-limiting thoughts, perceptions, and behavior. Such unprocessed implicit emotional learnings become intertwined and confused with the current experience, causing responses that are invisibly linked to the past while preventing desired outcomes in the present.

Most people, even those who are coping relatively well, carry numerous implicit memories that are echoed in their current behavior in ways that are self-limiting. If a male teacher who had bushy eyebrows was sexually provocative toward you, you may find yourself reflexively shying away from bushy-eyebrowed men. Sensory aspects of the original experience—smells, sounds, tastes, skin sensations, or images such as bushy eyebrows—can become triggers that evoke an old emotion or bodily response and result in your projecting it onto the current situation. Another person’s tone of voice, gesture, or facial expression may

cause you to overlay your emotions and responses from an early experience onto what is happening now. Resolving unprocessed memories through reconsolidation is a path out of these difficult and often self-defeating scenarios.

How the Brain Updates Emotional Learnings

Despite the stubborn tenacity of these deep emotional learnings, nature has established a mechanism for “updating existing learnings with new ones” (Ecker et al., 2012, p. 26). After an emotional memory has been brought to mind—in response to cues, triggers, context, or suggestion—the memory can, for a brief period, be reconsolidated in a new way. If, during this “reconsolidation window,” which can last for several hours, a second vivid experience is introduced which differs significantly “from what the reactivated target memory expects and predicts about how the world functions” (p. 21), the original learning can be revised or completely eliminated. The old learning is replaced by a new experience which first challenged and then “disconfirmed” the outdated beliefs, models, and interpretations. This new, incompatible experience produces a neural mismatch which chemically “unlocks” the synapses of the earlier memory and “renders [its] circuits labile,” that is, susceptible to change by “a new learning experience that contradicts (for erasing) or supplements (for revising) the labile target knowledge” (p. 27). For the synapses to “unlock,” the disconfirming experience must be evoked while the original learning is still in a reactivated condition. For the memory to be reconsolidated in a new way, the same disconfirming experience must be repeated, or another experience that contradicts the mental model that grew from the original memory must be introduced, during the reconsolidation period.

Demonstrated first in animal studies and then in humans, this process can rapidly and permanently change “learnings formed in the presence of intense emotion” which, until recently, had appeared to psychotherapists as well as brain researchers to be so indelible that it seemed, after they had been established, that “the brain threw away the key” (p. 3). We now know a great deal about the brain’s keys for unlocking the synapses that maintain emotional memory. Ecker et al. summarize the clinical implications of these developments: “with clear knowledge of the brain’s own rules for deleting emotional learnings through memory reconsolidation, therapists no longer have to rely largely on speculative theory, intuition, and luck for facilitating powerful, liberating shifts” (p. 4). Understanding the memory reconsolidation process has made it possible for clinicians to more systematically transform the core beliefs and mental models formed in response to earlier life experiences.

How Energy Psychology Interventions Resolve Unprocessed Memories

Psychotherapy is the art of freeing people from old, dysfunctional patterns that are rooted in the past and allowing them to reach potentials that would otherwise remain beyond their grasp. Ways of overcoming limitations that trace to childhood were first pioneered by psychodynamic therapists and have been decisively refined by cognitive-behavioral therapists. Newer “somatic therapies” introduce additional therapeutic elements that are believed to enhance the speed and efficiency by which old habits and conditioned reflexes can be interrupted and new ones established (Commons, 2000). These therapies—claimed by their proponents to be unusually effective in interrupting old habits of thought, feelings, and behavior, and in

establishing new ones—share in their use of physical interventions. Along with energy psychology, prominent therapies utilizing somatic interventions include Eye Movement Desensitization and Reprocessing (Shapiro, 2001), Gestalt Therapy (Polster & Polster, 1973), Hakomi (Kurtz, 2007), Sensorimotor Psychotherapy (Ogden, Kekuni, & Pain, 2006), and Somatic Experiencing (Levine, 2010).

In introducing the earliest energy psychology protocols, Callahan (1985) formulated a set of procedures that were remarkably attuned to the findings about memory reconsolidation that would emerge two decades later. The sequence of experiences necessary for systematically evoking the reconsolidation process to transform a target emotional learning, regardless of the form of therapy, is described by Ecker et al. (2012): (a) vividly accessing emotional memories or learnings that are involved in the targeted symptom, (b) concurrently activating an experience that contradicts implicit models or conclusions that were drawn from the original experiences—which Ecker et al. term a “juxtaposition experience,” and (c) verifying that the change has occurred. During these steps, implicit memories and learnings enter the neocortex-mediated explicit memory system and integrate with neural pathways that support established coping strategies, their earlier adaptive functions are examined and appreciated, and their automated, unrecognized influence on current perceptions, thoughts, and behaviors are eliminated. This is how unprocessed implicit emotional memories and learnings are “processed.”

In a typical energy psychology protocol, the initial rounds of acupoint tapping most often involve activating the symptom or presenting problem and the emotional learnings underlying it via imaginal exposure. The client calls up the issue using images, evocative phrases, or a felt sense of the problem. When the tapping has removed some of the emotional edge of the current problem, childhood memories that play into the current problem often spontaneously emerge and, as they become the new focus, their adaptive historical function can usually be discerned. Techniques for bridging to earlier memories, such as following a current feeling back to one of the first times that feeling was experienced, may also be used.

The second set of sequences—generating an experience that disconfirms the earlier learnings—is the most complex stage for most reconsolidation-oriented therapies, but it is where energy psychology protocols show their greatest advantage. Because stimulating selected acupoints almost instantly reduces limbic arousal (see Fang et al., 2009; Hui et al., 2005), the emotional landscape changes *during* the exposure. A traumatic memory or trigger that produced a physiological threat response is vividly imagined, but the disturbing physiological response is no longer present. The brain is experiencing a mismatch. The memory or trigger created a strong expectation that the implicit emotional learnings would be evoked, but the expected emotional reaction did not occur because acupoint stimulation had temporarily deactivated the limbic system. The juxtaposition of holding the troubling scene simultaneous with no physiological arousal is the mismatch that is the necessary ingredient for the scene that was mentally activated to be reconsolidated in a new way.

In this juxtaposition stage, energy psychology protocols closely mimic the early laboratory experiments with animals in which the role of reconsolidation was discovered. For instance, a red light in the cage of an experimental animal would glow just before a foul odor was administered. Once the implicit learning that the red light meant the odor was coming had

been established, the red light alone would cause the animal to try to avoid the odor. But if the expected odor is not released following the appearance of the light, a mismatch between expectations and perceptions is created: “The synapses of the schema's neural circuit [are] molecularly unlocked, like an unlatching of train cars still sitting in place [so] the schema can be modified or erased permanently” (Ecker, 2010, p. 45). These conditions can be easily created in the laboratory, but they are more challenging to create in a clinical setting. The mismatch in energy psychology treatments, however, is generated by simply tapping on the skin, almost too easy to believe. The required mismatch or “disconfirming experience” is effected by bringing the trigger to mind while preventing the threat response from occurring via the deactivating signals the acupoint stimulation sends to the amygdala. Other therapies often have to work much harder to create suitable mismatch experiences.

For Ecker et al.’s third stage (verifying that the change has occurred), energy psychology practitioners use SUD (subjective units of distress) ratings to provide both the clinician and the client not only a way of readily verifying that the desired outcomes have occurred, but also a gauge that can be frequently called upon to determine which elements of the treatment need adjustment or repetition. A single experience that contradicts an old learning can unlock the synapses, launching reconsolidation, but it usually must be repeated several times for unlearning to occur. The process of assigning the rating is essentially a mindfulness task that often also uncovers salient aspects of the situation that then receive attention.

The observations of Ecker et al. regarding therapeutic change, based on an understanding of the reconsolidation of emotional learnings, are consistent with the clinical and research findings emerging from within energy psychology. One of the most controversial, but most significant of these is that “transformational change through the erasure sequence does not rely on extensive repetition over time to effect change” (p. 32). The rapid outcomes seen in energy psychology treatments are consistent with Ecker et al.’s observations about “the swiftness with which deep, decisive, lasting change occurs through the therapeutic reconsolidation process” (p. 32). This of course “challenges traditional notions of the time required for major therapeutic effects to come about” (p. 32), as reports of the single-session energy psychology treatments of PTSD discussed earlier have tended to do. Another pertinent observation is that the “mismatch” component—the visceral experience that contradicts the client's existing emotional knowledge and becomes the basis for the new learning—“must feel decisively *real* to the person based on his or her own living experience . . . it must be experiential learning as distinct from conceptual, intellectual learning, though it may be accompanied by the latter” (p. 27). One of the most satisfying and frequently repeated experiences for energy psychology practitioners is watching the astonished expression on a person’s face when bringing to mind a memory or trigger, or entering an *in vivo* situation that 15 minutes earlier was met with the physiological components of terror but is now unable to produce any emotional charge whatsoever.

Variables that impact treatment speed and outcome include the age of the problematic emotional learning, its intensity, the context in which it was formulated, and the frequency of the experiences which led to and reinforced the emotional conclusions (Ecker et al., 2012). In discussing the durability of new learnings that are based on reconsolidation, Ecker et al. note that new learning of any kind of course “creates brain change in the form of new neural connections,” but “it is *only* when new learning also unwires old learning that *transformational* change occurs”

(p. 33). In therapies that take advantage of the natural reconsolidation process, the “new learning directly impinges upon and revises the circuits of the old learning, rewiring and updating them” (p. 33). Eliminating the old learning through reconsolidation is necessary for clinical outcomes where “symptom cessation is rapid and complete, not subject to relapse, [and] remaining symptom-free is effortless” (p. 33). Such changes are of a different order than “extinction training,” where learned responses are challenged and temporarily overridden by—but are *not* fundamentally changed or erased by—new conditioning. In reconsolidation, the original memory pathways are *themselves* changed. In extinction training, the new learnings are formed “in a physically separate memory system” that competes with “the target learning” (p. 16). As a result, extinction training has less power and the symptoms it does extinguish are subject to return.

Of particular interest with reconsolidation-informed therapies is the way that when an old emotional learning “is erased, erasure is limited to precisely the reactivated target learning, without impairing other closely linked emotional learnings that have not been directly reactivated” (p. 25). Consistent with reports from energy psychology practitioners, after the learned fear response has been eliminated, “subjects still remembered the experiences in which they had acquired the conditioned fear response, as well as the fact of having had the fear, but the fear was not re-evoked by remembering those experiences” (p. 25). In fact, energy psychology training programs teach practitioners to challenge positive outcomes (Adams & Davidson, 2011), asking the client to try to reproduce the fear, pain, anger, or other disturbing emotion associated with the target memory or trigger. If they can, the treatment is not complete. The speed with which an unwanted emotion can be decisively, experientially eliminated is one of the aspects of energy psychology treatments that clients find most convincing.

One final observation from Ecker et al.—that the treatment leads to an “increased sense of unified self and wholeness” (p. 33)—is also consistent with the outcomes reported by energy psychology practitioners. More than just overcoming symptoms, when outdated emotional learnings are transformed, eliminating their limiting beliefs and mental models, new connections with neural networks that support optimal functioning are formed. With little prompting, clients talk about themselves and their situation in more adaptive ways. Their view of their world and their place in it becomes more complex yet more coherent and empowering. In a comprehensive study of the developing mind, Siegel (2012) found increasing integration and coherence to be the hallmarks of healthy development. Such self-organization is reinforcing. Siegel explains that “a positive emotion arises with increases in integration, whereas a negative emotion occurs with decreases in integration” (p. 338). This impulse toward greater integration and health is organic. While self-limiting emotional memories that have not been processed interfere with the movement toward increased integration and coherence, they forcefully reveal themselves in symptoms, waking imagery, dreams, and problematic behavioral patterns. It is as if they push for expression in the psyche’s calculus for promoting self-healing and personal evolution until they have been adequately processed.

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