

Reconsolidation and Profound Change in Psychotherapy

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The recent discovery by brain scientists of the *reconsolidation* of memory circuits (see bibliography below) overturned the almost century-old tenet that conditioned responses in long-term implicit memory are indelible—permanent for the lifetime of the individual. Reconsolidation has been shown to actually eliminate a target implicit memory trace, rendering it impossible to reactivate, in sharp contrast with extinction, which merely suppresses conditioned responses without erasing them, allowing relatively easy reactivation.

The existence of reconsolidation appears to imply that the brain's built-in neurodynamics allow for profound change in emotional learnings formed early in life. This would have potentially revolutionary implications for psychotherapy. However, no methodology for the clinical, endogenous recruitment of reconsolidation has yet been put forward by neuroscientists, which may be why the discovery of reconsolidation remains uncommunicated to working psychotherapists and virtually unknown to them.

A safe, ethical, clinical process that reliably induces reconsolidation and selectively erases symptom-generating implicit memories, ending symptom production, would be a significant development. A peer-reviewed article now in press (Ecker and Toomey, 2008) presents evidence of such a clinical process, named Coherence Therapy. The evidence put forward is this:

- An implicit emotional schema that had been driving symptom production can no longer be re-evoked after decades of being easily evoked into virulent expression. Early in the process of Coherence Therapy, that schema is elicited into conscious, explicit, emotional experience. The profound depotentiation of the schema, which is clearly apparent in videos of sessions, rules out extinction-like mechanisms and is consistent with reconsolidation.
- Symptom cessation is an immediate result of this depotentiation. (Panic, depression, avoidance behaviors, etc. simply cease as soon as the emotional schema driving them is devoid of subjective realness.)
- The well-defined clinical steps that produce the depotentiation are unusual among psychotherapies, but correspond one-to-one to the steps identified by neuroscientists as bringing about reconsolidation.

Though it is too early to regard the methodology of Coherence Therapy as an empirically-based therapy, it is well situated to be understood and studied within a framework of empirical knowledge, owing to (a) the existing evidence supporting its putative recruitment of reconsolidation, as noted above, and (b) Ecker and Toomey's (2008) detailed analysis of its probable neurological substrates, some of which should be detectable on fMRI brain images.

Ecker, a co-originator of this methodology, is seeking to study the neural correlates of its clinical effects through fMRI images of brain response. As described on the next page, potentially these images could corroborate the occurrence of reconsolidation. The value of this kind of study was emphasized in a recent review article on the neurobiology of psychotherapy by neuroscientists Etkin, Pittenger, Polan and Kandel (2005), who conclude, "There is no longer any doubt that psychotherapy can result in detectable changes in the brain. ...[S]everal lines of evidence point to an important role for neuroimaging...in following the success of therapeutic interventions..."

Establishing the recruitment of reconsolidation in psychotherapy would be an historic development. Ecker and Toomey (2008) propose that the 70-year-long plateau in psychotherapy outcome efficacy could be due to the reliance of a wide range of procedurally different psychotherapies on the same core strategy of extinction-like "counteracting," as distinct from true depotentiation (erasure) of the unconscious/implicit schemas maintaining symptoms. Currently among clinical outcome researchers there is widespread skepticism regarding the existence of any specific treatment effect in psychotherapy. However, the discovery of reconsolidation changes the picture in a fundamental way. Any therapy that achieves reliable control of the reconsolidation process should demonstrate a specific treatment effect as well as a significantly higher level of psychotherapeutic efficacy, at long last.

fMRI Study of Coherence Therapy: Specific Objectives

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The study envisioned by Ecker would be unique in generating the first fMRI data obtained *during* therapy sessions in order to identify the neural substrate of specific, transient mental processes that putatively are crucial to psychological and behavioral change in Coherence Therapy. Ecker proposes conducting therapy sessions with the therapy client in the fMRI apparatus.

Coherence therapy follows a strategy of retrieving and then depotentiating the specific emotional schemas in implicit memory that are maintaining a given symptom or problem. These nonverbal schemas, completely subcortical and unconscious at the start of therapy, emerge into awareness experientially. Their verbalization is required for integration into conscious, neocortical knowledge and conscious, right-hemispheric emotional meaning. Once integrated, a retrieved schema is then subjected to a transformative, well-defined process of depotentiation.

Each of those activities of retrieval and transformation is carried out in Coherence Therapy through a specialized, focused methodology, and each yields pivotal mental events that are readily identifiable at certain moments. For example:

- A subcortical schema is reactivated and reveals its presence by producing a noticeable internal experience, such as an emotion, image, and/or a meaning-laden cognition, providing a point of access for further eliciting.
- The schema's nonverbal, constituent knowledge structures (component constructs) emerge into conscious, right-hemispheric emotional experience and then are verbalized, creating a concurrent neocortical knowledge of the constructs.
- The symptom is recognized lucidly to be part of the adaptive response launched by the now-conscious schema (recognition of personal agency).
- An experience of disconfirmation causes depotentiation of the schema (presumably recruiting reconsolidation of the implicit memory circuits that encode the schema).

A great deal stands to be learned, both clinically and neurologically, by obtaining fMRI images identifying the brain systems participating in these therapeutic events. Questions that could be answered include:

- What brain regions are responsible for generating a specific type of clinical symptom? (Coherence Therapy's methods are highly selective in activating and manipulating the specific unconscious constructs involved in symptom production, and so should be richly fruitful for correlating specific cognitive and emotional symptoms with brain regions.)
- Does subjective depotentiation of an emotional schema, with associated symptom cessation, correspond to immediate disappearance of some local brain activity?
- What kinds of clinical symptoms arise as conditioned responses generated by emotional schemas in subcortical implicit memory—as distinct from other models of symptom production? (Coherence Therapy practice over the past decade suggests that implicit memory is the cause of a wide array of symptoms often ascribed to other causes.)

- Treatment-specific effects may be identifiable (contrary to the prevalent model of common factors) through comparison of pre/post fMRI images with those already reported for cognitive-behavioral therapy. (For example, as described by Toomey and Ecker (2008), “Brain imaging studies of the reduction of depression by SSRIs and by CBT show that those two types of treatment have quite different effects on over a dozen brain regions (Goldapple et al., 2004), yet the two treatments are known to have essentially equal efficacy in producing symptom relief (DeRubeis, Gelfand, Tang and Simons, 1999; Hollon et al., 1992). The post-CBT brain scans show regional effects that are consistent with the psychological model of counteractive change posited by CBT, lending support for that model. A corresponding study carried out for coherence therapy could indicate whether coherence therapy’s models of symptom production and symptom cessation are likewise consistent with changes of brain activation resulting from coherence therapy. Distinct differences should be apparent between post-treatment brain scans of CBT and coherence therapy responders. For example, ...a hyperactive subgenual cingulate (Brodmann area 25) is a key characteristic of depressed persons (Mayberg et al., 1999). An important component of cortico-limbic pathways, this region has been shown to be a main neural correlate of the feeling of sadness (Liotti, Mayberg, Brannan, McGinnis, Jerabek and Fox, 2000). Curiously, CBT, even when effective in reducing depressive symptoms, does not diminish the activation of this region (Goldapple et al., 2004). We have conjectured an explanation based on coherence psychology: hyperactivation of area 25 may be caused by chronic activation of specific, unconscious, sadness-inducing personal constructs held in subcortical implicit memory. CBT by design does not access or depotentiate such deeply unconscious material, but we believe coherence therapy will prove to do precisely that, and would therefore yield post-therapy brain scans of responders that show diminished activity in area 25.”)

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