

**Richard D. Lane, M.D., Ph.D.
Professor of Psychiatry,
Psychology and Neuroscience
The University of Arizona
Tucson, Arizona**

**Memory Reconsolidation,
Emotional Arousal and the
Neuroscience of Enduring Change:
Implications for Psychoanalysis**

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Lecture #10

Research Implications of the Memory Reconsolidation Model

- Purpose of the course: Put Psychodynamic Psychotherapy (PDT) and Psychoanalysis (Psa) on a stronger empirical footing
- Validating the 3-step change process based on MR
 - Establishing that MR has occurred
 - Measuring recurrent maladaptive patterns
 - Measuring corrective emotional experiences
 - Documenting steps in the change process
- Research aiming to optimize treatment outcomes based on MR

The Importance of Empirical Research

- The purpose of this course is to put psychoanalysis (psa) and psychodynamic psychotherapy (pdt) on a **stronger empirical footing**
- Needed because Psa rejected empirical research for many years
- Insurance companies and consumers now demand it
- CBT is now dominant and psa is in decline
- **Many classic psychoanalytic claims can't be falsified**
e.g. depression following bereavement due to ucs guilt
- Shedler and Leichenring: it is now established that PDT is effective
- **Can the mechanism of change also be demonstrated?**
- Some argue that this is needed even though efficacy established

Need for Common Definition of Enduring Change Applicable Across Modalities

- Typically 3-6 month f/u in psychotherapy studies
- Grant funding typically lasts 3-5 years
- Funding terms don't allow long-term follow up
- A consensus panel is needed to create a definition
- How best to measure change: symptoms vs. functioning (Shedler-Westen)
- 2 year f/u likely insufficient; 5-10 yrs more realistic
- Perhaps need new grant funding specifically for this purpose
- Need an interested and motivated billionaire
- Need participants in original study to consent to long-term f/u

A Definition of Mental Health

Table 2

Definition of Mental Health: Items From the Shedler–Westen Assessment Procedure (SWAP–200; Shedler & Westen, 2007)

- Is able to use his/her talents, abilities, and energy effectively and productively.
- Enjoys challenges; takes pleasure in accomplishing things.
- Is capable of sustaining a meaningful love relationship characterized by genuine intimacy and caring.
- Finds meaning in belonging and contributing to a larger community (e.g., organization, church, neighborhood).
- Is able to find meaning and fulfillment in guiding, mentoring, or nurturing others.
- Is empathic; is sensitive and responsive to other people's needs and feelings.
- Is able to assert him/herself effectively and appropriately when necessary.
- Appreciates and responds to humor.
- Is capable of hearing information that is emotionally threatening (i.e., that challenges cherished beliefs, perceptions, and self-perceptions) and can use and benefit from it.
- Appears to have come to terms with painful experiences from the past; has found meaning in and grown from such experiences.

- Is articulate; can express self well in words.
- Has an active and satisfying sex life.
- Appears comfortable and at ease in social situations.
- Generally finds contentment and happiness in life's activities.
- Tends to express affect appropriate in quality and intensity to the situation at hand.
- Has the capacity to recognize alternative viewpoints, even in matters that stir up strong feelings.
- Has moral and ethical standards and strives to live up to them.
- Is creative; is able to see things or approach problems in novel ways.
- Tends to be conscientious and responsible.
- Tends to be energetic and outgoing.
- Is psychologically insightful; is able to understand self and others in subtle and sophisticated ways.
- Is able to find meaning and satisfaction in the pursuit of long-term goals and ambitions.
- Is able to form close and lasting friendships characterized by mutual support and sharing of experiences.

Shedler J. American Psychologist 2010; 65(2): 98-109

Requirements for Demonstrating Memory Reconsolidation (Elsey, Van Ast and Kindt, 2018)

- Reactivation x Manipulation interaction
- Time dependency
 - intervene within time window of 4-6 hours
- Memory specificity
- Dissociation of immediate and delayed effects
 - sleep is necessary for reconsolidation
 - demonstrate altered memory the next day and in long-term follow-up (e.g. 1 year)

Ecker: Proposed Universal Template for Transformational Therapeutic Change

Table 11.2 The Therapeutic Reconsolidation Process, Proposed as a Universal Template that Translates Reconsolidation Research for Facilitating Transformational Therapeutic Change

Therapeutic Reconsolidation Process

Preparation phase

- A. Symptom identification
- B. Retrieval of memory contents generating symptom (target emotional learning/mental model/schema)
- C. Identification of contrary, disconfirming knowledge or experience

Erasure sequence (ECPE)

- 1. Reactivation of target learning
- 2. Destabilization of target learning: Activation of contrary knowledge mismatches target schema
- 3. Nullification of target learning: A few repetitions of mismatch for counterlearning during remainder of session

Verification phase

- V. Verification of target learning erasure:
 - Symptom cessation
 - Non-reactivation of target learning
 - Effortless permanence
-

Establishing Memory Reconsolidation Mechanism in Psychotherapy

- Elsey, Van Ast and Kindt (2018) proposed rigorous criteria
- To date this has not been demonstrated in psychotherapy
- Ecker's treatment method lends itself to rigorous testing
- Independent replication of Ecker's method also needed
- Ecker's method could be used to test Elsey's criteria
 - Reactivation (R): Target emotional learning (Fa miserable)
 - Manipulation (M): Contrary knowledge (teachers are happy)
 - Could do R, M and RxM on separate days
 - Could demonstrate specificity in R1 vs. R2
 - Could do manipulation within 6 hours or later
 - Evaluate status of memory change on day of and day following

Measurement of Recurrent Maladaptive Pattern CCRT – Core Conflictual Relationship Theme (Luborsky, Crits-Christoph)

- A reliable method to assess RMPs is needed
- CCRT: wishes; expected or actual response of others;
response of the self
- Can be rated reliably by the RAP (Relationship Anecdotes Paradigm)
method: 10 different situations or from psychotherapy sessions
- Is CCRT associated with intolerable distress that is avoided?
- Can adaptive changes in CCRT be reliably detected/rated?
- What processes enable improvement in CCRT?
conflict resolution? transforming intolerable emotion? both?
- Can RMPs be defined and measured in terms of intolerable distress?

Comparison of 2 Types of Corrective Experience: Mismatch vs. Arousal

- Ecker's method highlights the importance of **information mismatch** to destabilize and update the target memory
- The approach of Lane et al. highlights corrective emotional experiences as the source of the mismatch
- **Arousal** has been proposed as a way of measuring CEE
- Measuring arousal per se may not discriminate between the two and likely misses the specificity needed for CEE
- **Ideally the CEE is an emotional experience that meets an important unmet need**
- How to operationalize this is challenging and is as yet an unresolved issue

How Do CEEs Come About? Are They Planned or Are They Spontaneous?

- F Alexander was criticized for creating artificial experiences
- Modern psychoanalysts are more accepting of the concept if CEEs happen spontaneously
- “Simply” being a therapist with genuine curiosity, respect and empathy can create CEEs
- Can a CEE be planned **and executed as planned**?
- Hanna’s experience with Becky: the prepared mind recognizes when an opportunity arises in the moment
- Research question: Does the therapist anticipating what the client needs from a CEE lead to more CEEs occurring and better treatment outcomes?

Extent of Emotion Activation Needed to Update an Emotion-Laden Memory

- In classic MR research only a reminder is needed to reactivate the memory and make it labile (updatable); full recall not nec.
- A key question is whether **more than a reminder** is needed to update the emotional component of a memory
- This is especially relevant when considering memories associated with **intolerable emotion**
- To what extent does the painful emotion need to be **fully experienced** in order to be transformed?
- Research in EFT suggests that this is the case
- Perhaps the CEE only needs to **counter the cause of the intolerable distress** (Gershman: latent causal structure of the situation)

Do Social Perceptions Change After CCE? Does the RMP Change?

Table 12.2 Components and Specifications of the Corrective Emotional Experience (CEE)

1. Client must have experienced traumatic events which were not dealt with successfully in the past.
2. Client must be re-exposed to these emotional situations.
3. Reexposure must occur in more favorable circumstances.
4. Client must face the reexposure.
5. ~~Re-exposure does not need to occur with therapist~~
6. Therapist (or another significant person) expresses an attitude different from that displayed by the person in the original event.
7. Client must handle or react to this novel situation in a different manner.
8. May take repetitions before a new ending occurs.
9. Insight is neither necessary nor sufficient to bring about the CEE.
10. Patient may have insight into this CEE, but the experiential component holds predominance.
11. Trauma becomes "repaired" in some way
12. Results of CEE should generalize.

Note: Modification of Sharpless and Barber (2012).

- Need a method to reliably identify a CEE by therapist and client
- Hypothesis: immediately after a CEE social predictions change
- Can this hypothesis be falsified?
- Potentially, but frequent interviews can change the therapy process
- Client can keep a diary or be interviewed; can assess the probability that CEE is followed by perception change
- CEE needs to update the memory, not create a new one (small PE)

How Many Repetitions Needed for Each of the 3 Steps of the Change Process?

- Use established psychotherapy treatment data sets with sessions recorded
- Compare successful and unsuccessful treatments
- How many repetitions of each:
 - Step 1: Activate memory and painful emotion
 - Step 2: Corrective emotional experience
 - Step 3: Application to real world contexts
- Is juxtaposition of 1 and 2 common in successful and uncommon (step 1 only) in unsuccessful treatments?
- Can record the number of reported step 3 events
- Older, stronger, more differentiated memories – more reps needed?

Do Memories Actually Change or Does Interpretation of Memory Change?

- Memories are reconstructions that engage multiple systems and are known to be malleable (i.e. memories are not fixed entities)
- Does the emotional content of the memory change?
- Could be studied in 3 different prospective contexts:
 - 1) accounts of early trauma in therapy; 2) childbirth; 3) rape
- Could do laboratory study using evocative stimuli and emotional responses (including physiology)
- Would predict transformation (e.g. positive and negative emotions), not just attenuation of negative emotion
- Would expect changes in predictions that are enduring
- If only interpretation changes, would expect variability & return to baseline
- Compare to changing the interpretation of a somatic symptom:
changing it makes it less distressing

Do Corrective Emotional Relationships Happen in Other Modalities?

- “Simply” being a therapist with genuine curiosity, respect and empathy may create CEEs
- As therapists gain more experience, and merge techniques with their own personalities, recognizable elements of specific techniques decrease / similarities across treatments increase
- **Trait therapeutic alliance** (makes treatment possible) and **state therapeutic alliance** (the therapeutic experiences that bring about change) **need to be differentiated**
- Interview clients post treatment in any treatment modality
- Have clients **describe what mattered to them most** in the treatment
- Obtain objective ratings of these reports from trained raters

Narrative-Emotion Process Coding System (NEPCS; Angus Lab, 2015)

Problem Markers				Transition Markers				Change Markers	
Same Old Story	Empty Story	Unstoried Emotion	Superficial Story	Reflective Story	Inchoate Story	Experiential Story	Competing Plotlines	Unexpected Outcome	Discovery Story

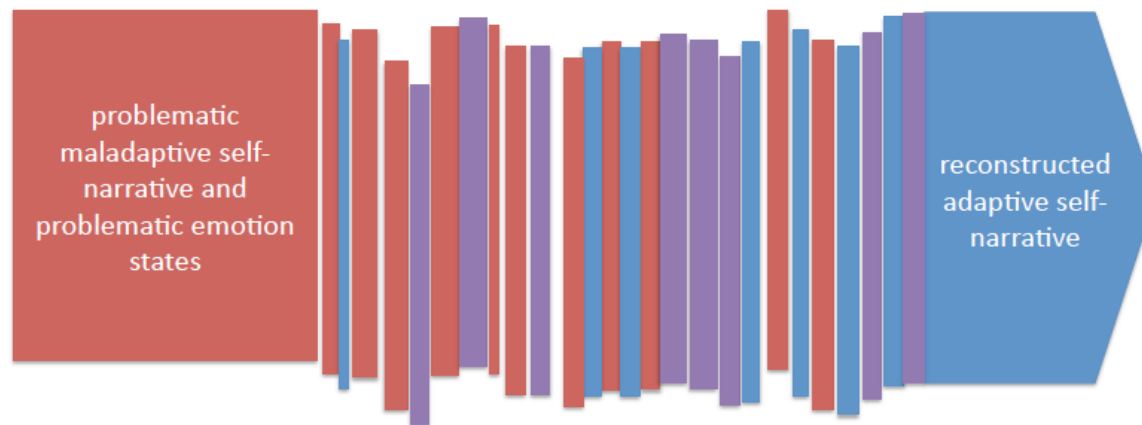


Table 12.4 Session 5 NEPCS Markers for Therapist and Client by Minute

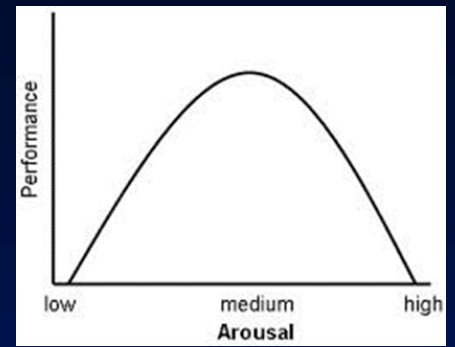
	Problem Storytelling
	Transition Storytelling
	Change Storytelling
	No Marker
Therapist	Client
Superficial	Superficial
Competing	Superficial
Competing	Superficial
Reflective	No Marker
Competing	No Marker
No Marker	Competing
No Marker	Reflective
No Marker	Unexpected
Reflective	Reflective
Unexpected	Unexpected
Discovery	Unexpected
Discovery	Discovery
Discovery	No Marker
Competing	Competing
Competing	Competing
Competing	No Marker
Competing	No Marker
Reflective	Reflective
Reflective	Reflective
Competing	Competing
Unexpected	Competing
Competing	Competing
Reflective	Discovery
Inchoate	Inchoate
Competing	Inchoate
Discovery	Discovery
Competing	Competing
Discovery	No Marker
Discovery	Discovery
Discovery	Discovery
Reflective	Discovery
No Marker	Reflective
Competing	Superficial
Reflective	Reflective
Competing	Superficial
Competing	Reflective
Discovery	No Marker
Discovery	No Marker
Discovery	Discovery
Unexpected	Discovery
Unexpected	No Marker
Discovery	Unexpected
Discovery	Unexpected
Competing	No Marker

NEPCS captures the manner and quality of the narrative organization and emotional processing in therapy sessions

Demonstrating That NECPS Aligns with Memory Reconsolidation

- NECPS coding can be done for each minute of therapy for both therapist and client
- 3 major categories; 9 subcategories
- Same Old Story = RMP
- Need to code sessions for RMP, CEE and any change in RMP
- Predict CEE associated with transition and change markers
- Need to examine what determines the relation between Change Markers (Unexpected Outcomes and Discovery Stories) and actual change in the schematic memory (IWM/RMP/CCRT)
- Expect change in RMP (CCRT) that is enduring

Is Moderate Arousal During Psychotherapy Optimal?



- Observed in EFT research that a moderate level of arousal during psychotherapy is optimal
- Does it apply to PDT during mentalization?
- Could use real time display of HRV during the session to assist therapist in judging client's readiness to mentalize
- Could be used to assess whether mentalizing ability really is better during moderate arousal
- Could add brain imaging component (fNIRS) to assist in evaluating contribution of medial prefrontal cortex
- What is the client's set point for medial pfc going offline?

Testing the Effectiveness of Enlivening Methods to Increase Emotional Experiencing and Processing

Accessing and processing emotion

6. Encourages the client to experience and express affect in the session
7. Facilitates clients' becoming aware of emotions on the edge of awareness, and uses various strategies to help clients deepen their emotional experience
8. Helps clients label their emotional experience and recognize its goal-directed significance
9. Helps the client access, experience, and deepen attachment-related feelings and/or primary emotions specifically related to the CMP
10. Uses therapeutic presence and emotional resonance with the client for emotion regulation, processing, and transformation

- In TFP study psychotherapists were given **special training** in TFP and then compared to treatment as usual
- The same could be done instructing PDT therapist in **EFT methods**
- Then compare to TAU
- Predict:
 - a) faster improvement
 - b) fewer sessions
 - c) more enduring change

Do Old Problematic Procedures Get Updated Or Must New Responses Always Be Intentionally Deployed?

- This is a key difference in the Solms and Lane perspectives
- The answer is closely tied to the **implementation and success of a more emotion-focused approach**
- Following corrective experiences in therapy (insight vs. CEE), **do more adaptive responses to problematic situations happen automatically, and habitually**, or must maladaptive responses **always be inhibited** so that new more adaptive responses can be intentionally selected?
- Assessment method must keep clients and raters blind to the hypotheses under investigation

Interpretations: What Makes Them Effective?

- Traditional criterion of usefulness: does it lead to client disclosing new, important information
- Is it **the content of the interpretation**— making the unconscious conscious, or increased understand — or **the implicit emotional messages conveyed and their corrective effect** -- that determines outcome?
- Emotion-focused training could include instruction in conveying implicit messages in interpretations
- What should be the goal of the implicit messages?
Is it to meet the **unmet emotional need**, as defined by the CCRT?

Primitive Defenses: The Role of Mental Representation Deficits

- Projective identification, splitting, dissociation and somatization
- Hypothesis: Each is associated with impairment in mental representation of emotion
- What is the **time course** for over-coming primitive defense?
- **How** can they be overcome?
- **What processes are needed?**
- Once overcome, have clients describe what made overcoming them possible
- **What emotion(s) were defended against?**
- **Were emotions formulated for the first time** (especially in the case of trauma)?

Napping and Time of Day of Therapy Sessions

- Sleep is necessary for consolidation and reconsolidation
- Do 20 minute “power naps” promote better outcomes vs. 20 minutes of reflection vs. 20 minutes relaxation vs. no instruction (obtain self report)
- Does REM or NREM content of these naps matter?
- Monitor next 6 hours and determine if stress during the 6 hour window influences outcome
- Are the benefits of CEE undone by post-session stress?
- Time of day: early vs. late appointments; need to evaluate what transpires and whether this influences outcome

Avoiding Medications That Inhibit REM

- Certain medications inhibit REM (SSRI, SNRI, TCA, BZ) and thus may interfere with enduring change due to MR
- Relevant to the **2-stage model of outpatient treatment**: initially provide medication to treat symptoms; then conduct psychotherapy to prevent relapse
- Controlled trials suggest an advantage to continuing antidepressants (AD) relative to placebo in preventing relapse
- Discontinuation not recommended if at least 3 previous episodes
- Proposal: In depressed patients in remission for 6 months receiving ongoing psychotherapy, **compare relapse rates** in those who discontinue AD compared to those who don't

Use of Medications to Destabilize Priors

- Older, stronger and more differentiated memories are hardest to change
- Hallucinogens most commonly used to treat specific conditions such as depression, PTSD, substance dependence
- Psychotherapy used primarily to ensure a “good trip”
- An alternative is to **have psychotherapy drive the change process**
- New research is needed to explore whether low or very low dose hallucinogens can **promote neural plasticity (decreasing the precision of highly precise priors)** and expedite how quickly change that is enduring can occur

Retreat Style Program in Day Hospital / Intensive Outpatient Treatment

- **Personalize** the treatment program based on the assumption that memory reconsolidation is the principal mechanism of change
- **End session** when a CEE has occurred (as judged by the therapist)
- Take a **nap** vs. monitor post-session activities
- Consider the possibility of **more than 1 session** per day
- Arrange opportunities to **practice** new ways of construing and responding to situations (due to CEE) in other contexts
- **Avoid medications that inhibit REM**
- Compare response and relapse rates to treatment as usual

Continuation of Improvement After Psychotherapy Ends

- The guiding hypothesis is that IWM is frozen due to the need to avoid intolerable affect and effective psychotherapy liberates IWM to flexibly respond to life circumstances
- Upon completion of treatment client has the tools to resolve issues on their own
- Some evidence indicates that improvement continues after therapy ends
- Can use Shedler-Westen method to assess functioning, not Sx
- Can evaluate whether CCRT continues to change
- Continued improvement would help to ensure enduring change

Conclusions

- Defining the change process in Psa and PDT in a way that is **clearly defined and measurable is essential**
- The current approach, focused on recurrent interpersonal patterns and transforming intolerable emotional distress, is **more empirically tractable than resolution of unconscious conflict**
- Dozens of research questions have been posed that can be empirically tested and falsified
- **New methods need to be developed** to capture the essential ingredients and processes in this context
- This program of research will require active collaboration and engagement of **psychotherapy researchers** and **sources of funding**
- Such research will help ensure the **long-term survival**, as well as the **effectiveness and efficiency**, of Psa and PDT