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Experimental approaches to repression

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NPSA 2018

Overview

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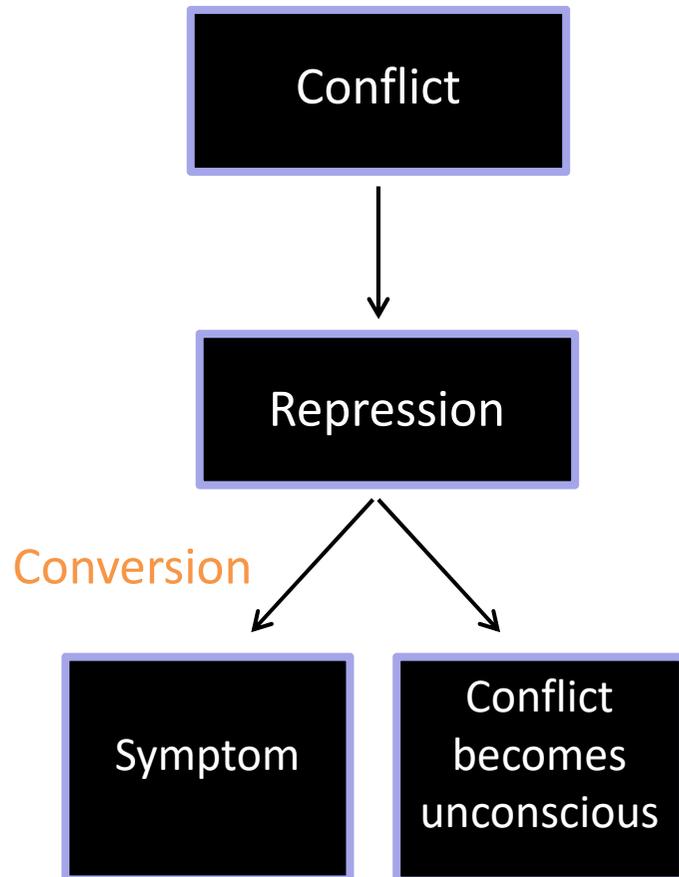
- Introduction: repression and suppression
- Intentional memory suppression
- Repression

Overview

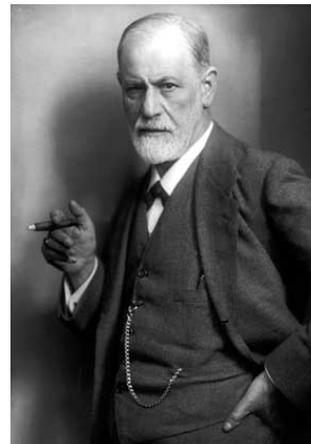
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- Introduction: repression and suppression
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Repression



- Central mechanism for generation of the psychodynamic unconscious
- Conversion: link between body and mind, energetic and hermeneutics



„The theory of repression is the corner-stone on which the whole structure of psycho-analysis rests.“

Repression and suppression

- Freud (Repression, 1915): „*the essence of repression lies simply in the function of rejecting and keeping something out of consciousness*”
- Is unconscious repression the same as conscious suppression?
- Indeed: Freud’s original definition only referred to a **process** regardless of its **cause** or **motive** (see also Erdelyi, BBS 2006)

Repression ≠ suppression

	Repression	Suppression
Executive control	Driven by internal conflicts that reduce executive control	Recruits executive control
Process characteristics	Unconscious / automatic	Voluntary and conscious (but....)
Consequences	No erasure: „return of the repressed“	Erasure
Content	Only wishes/desires in psychodynamic conflicts	Anything
Link to resistance	Induces resistance	Does not induce resistance

An integrative model

Repression may consist of 2 consecutive phases (cf. talk by Beate Krickel)

Phase 1

- Inhibitory intention is conscious
- Suppression occurs deliberately / controlled
- Suppression may be successful (erasure of suppressed contents)
- **Adaptive process that helps in emotion regulation (see Engen and Anderson, TICS 2018)**

Phase 2 (in case phase 1 was not successful?)

- Intention to repress has become unconscious
- Repression occurs automatically / unconscious
- Repression is not successful: repressed affects remain, repressed contents may come back
- **Maladaptive pathogenic process**

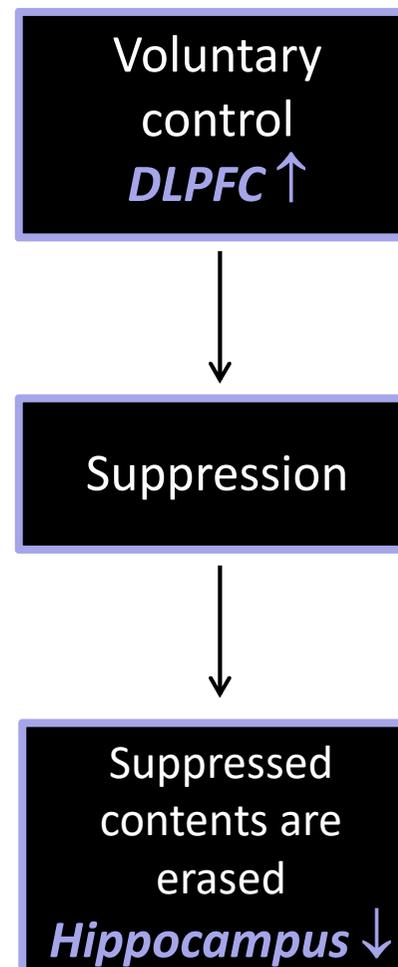
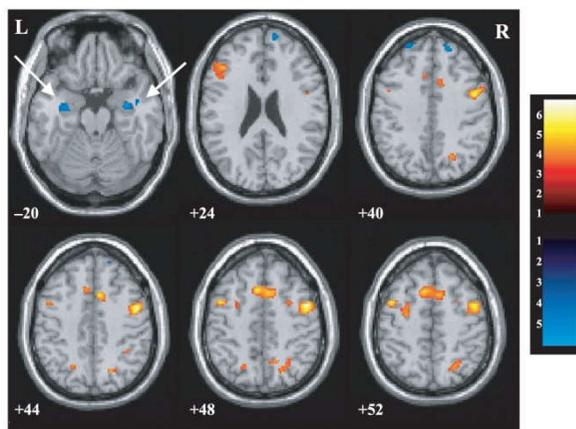
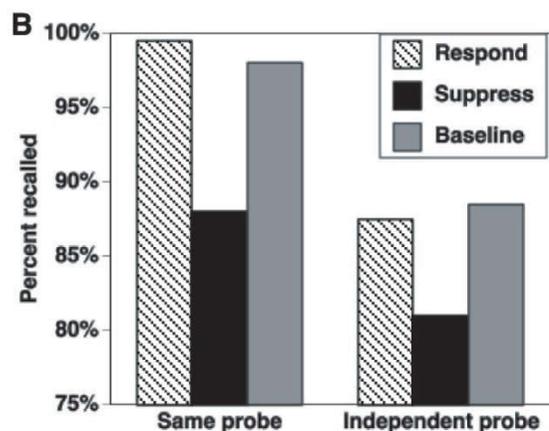
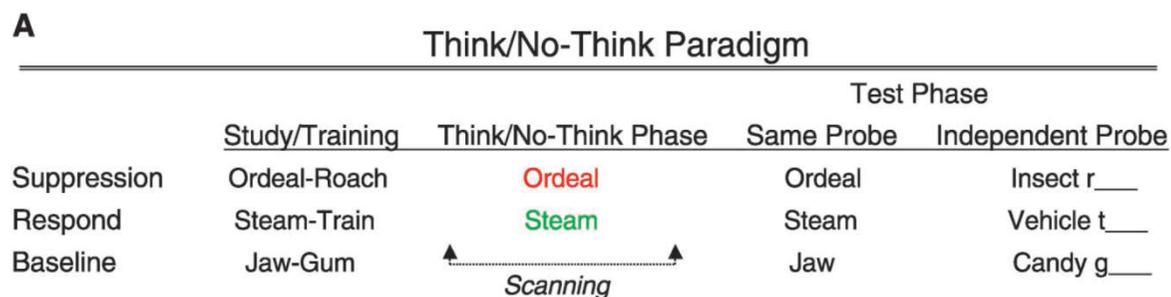
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- **Intentional memory suppression**
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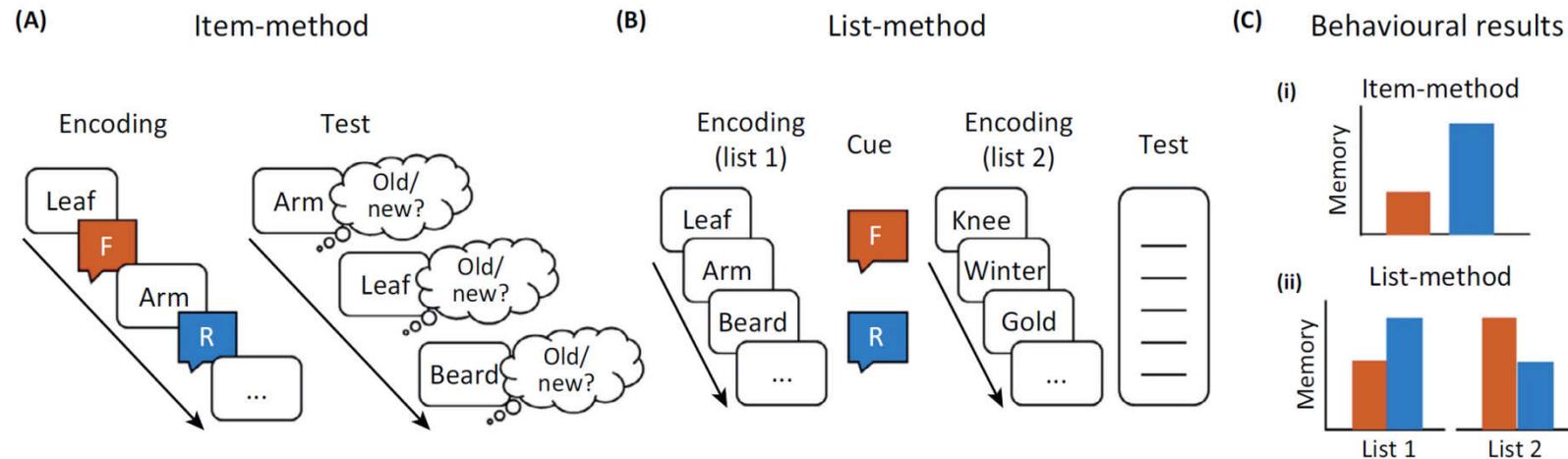
Intentional memory suppression: The „Think/No-Think“ paradigm

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- Suppression during retrieval
- Memory for No-Think items < baseline

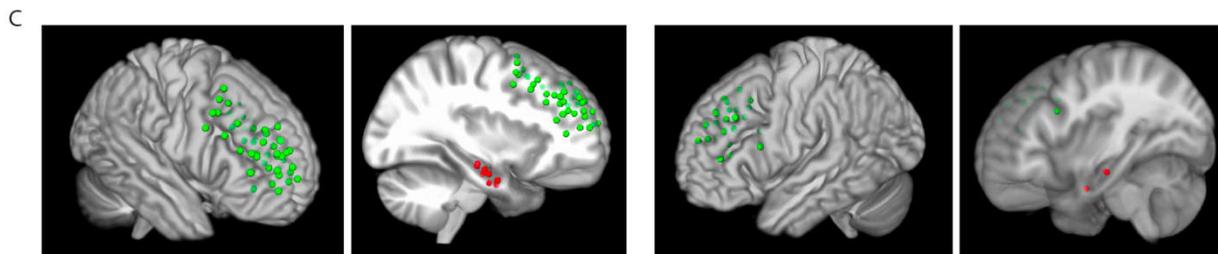
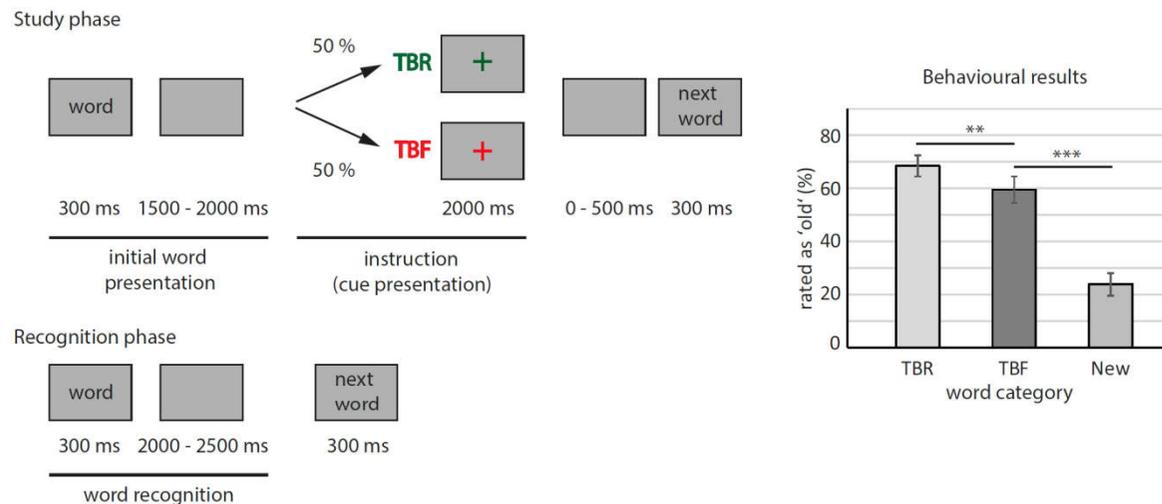
Intentional memory suppression: The „directed forgetting“ paradigm



- Suppression during encoding
- Neural correlates: DLPFC \uparrow , hippocampus \downarrow
- Problem: Is there really inhibition in the directed forgetting paradigm (or just reduced encoding/consolidation)?
- Talks by Marie Fellner and Gerd Waldhauser: EEG evidence for consecutive employment of active inhibition and rehearsal

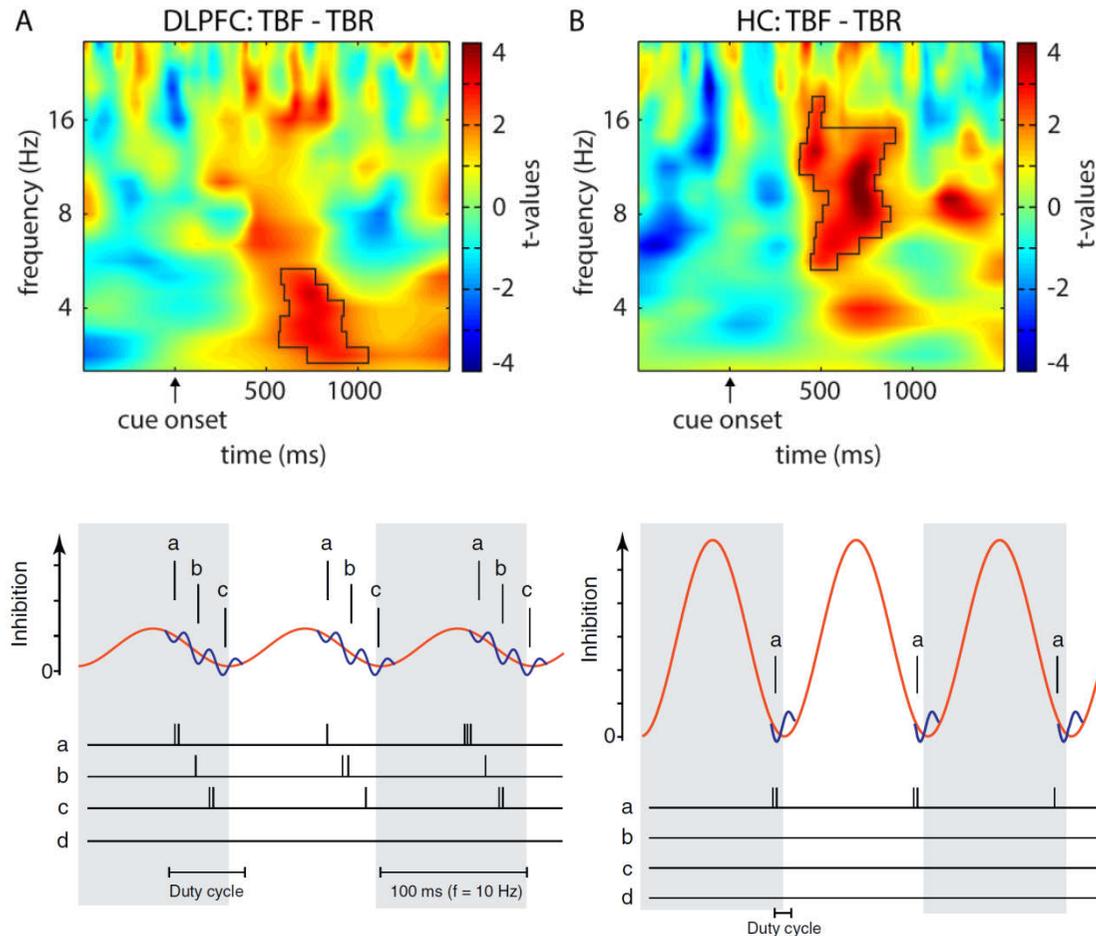
Intentional memory suppression: The „directed forgetting“ paradigm

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- Intracranial EEG recordings in presurgical epilepsy patients
- DLPFC electrodes: n=13; hippocampal electrodes: n=15
- Both areas: n=6 (5 right, 1 left)

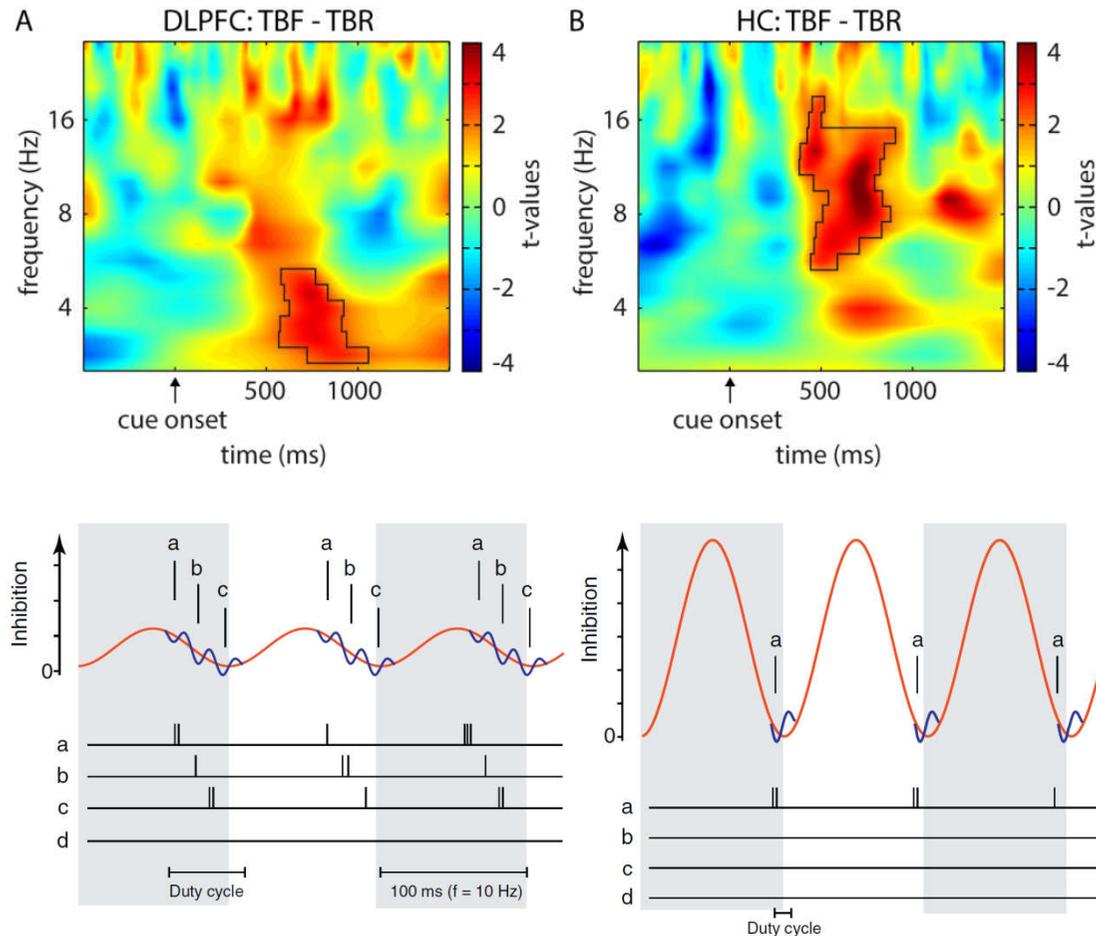
Intentional memory suppression: The „directed forgetting“ paradigm



To-be-forgotten items

- DLPFC theta power \uparrow
→ voluntary control processes
- Hippocampal alpha power \uparrow
→ memory inhibition

Intentional memory suppression: The „directed forgetting“ paradigm



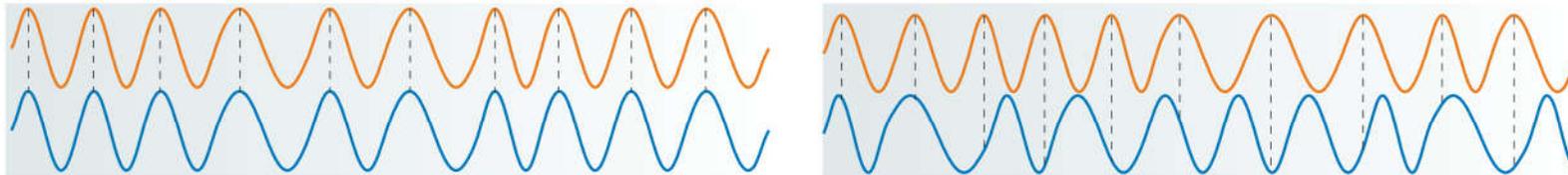
To-be-forgotten items

- DLPFC theta power \uparrow
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Intentional memory suppression: The „directed forgetting“ paradigm

Increased DLPFC-hippocampal communication for to-be-forgotten items

- Power correlations:
DLPFC theta power, HC alpha power (lagged correlations consistent with conduction delays)
- DLPFC-HC phase synchronization
(with phase lags consistent with conduction delays)



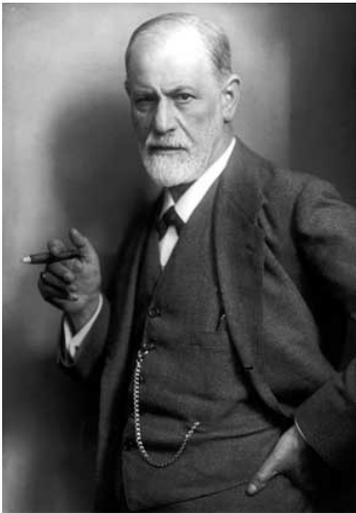
- Granger causality: directional coupling DLPFC → HC

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Repression and free association



Free Association



Repressed contents may be expressed

Resistance: delay, emotional reaction



Renewed repression

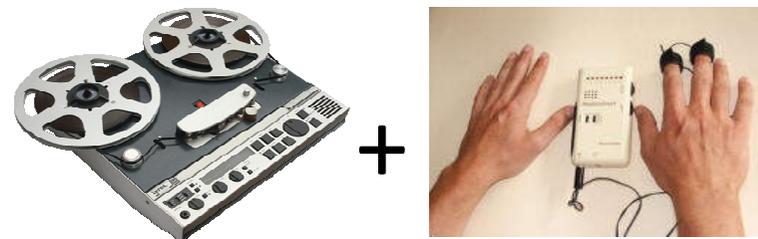
C.G. Jung's association experiment



C.G. Jung's association experiment

- Operationalization of resistance and repression
- Reading of word list
- Recording of association, reaction time (RT) and skin conductance response (SCR)
- Hypothesis: RT ↑, SCR ↑
→ unconscious / repressed conflict

head
water
death
...



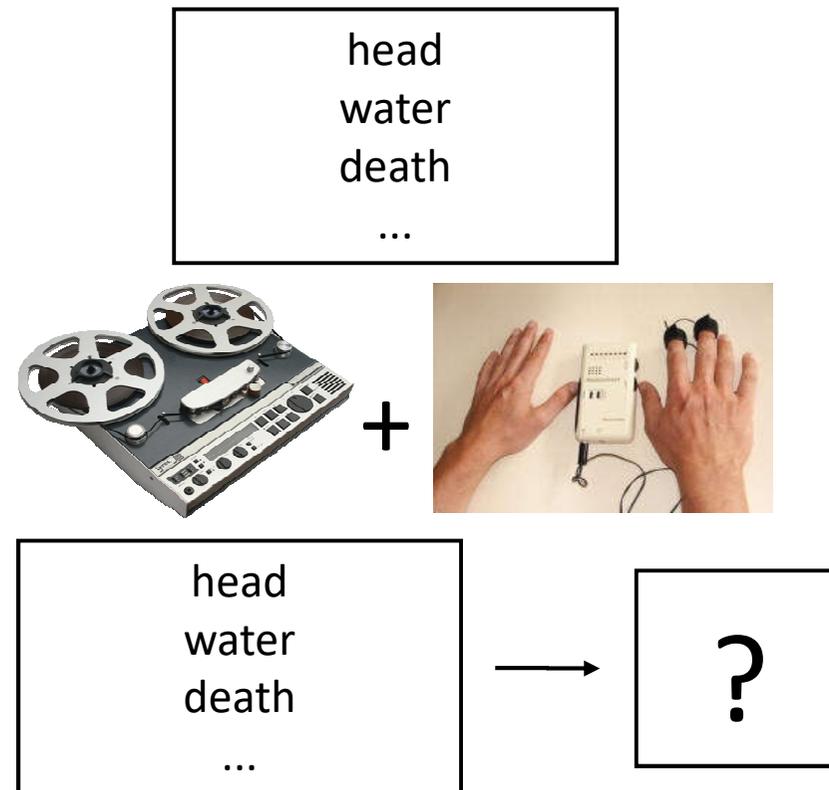
Free association → Resistance → Repressed content
(delay, emotional reaction)

Levinger & Clark (1961): „Emotional factors in the forgetting of word associations“

Adaptation of Jung's method
+ subsequent cued recall

Results

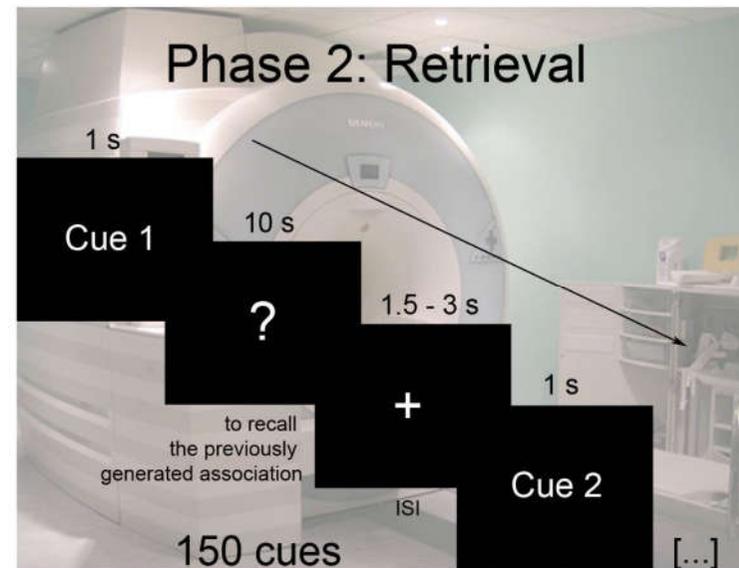
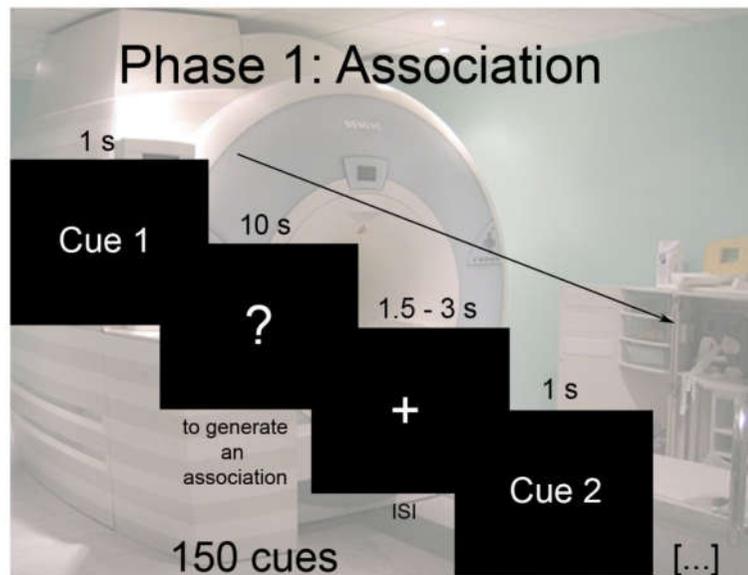
High SCR → forgetting
Long RT → forgetting



Replications: Rossmann, 1983; Köhler and Wilke, 1999; Thöns, 2002

Study 1: Free association to word list (Jung's paradigm in the scanner)

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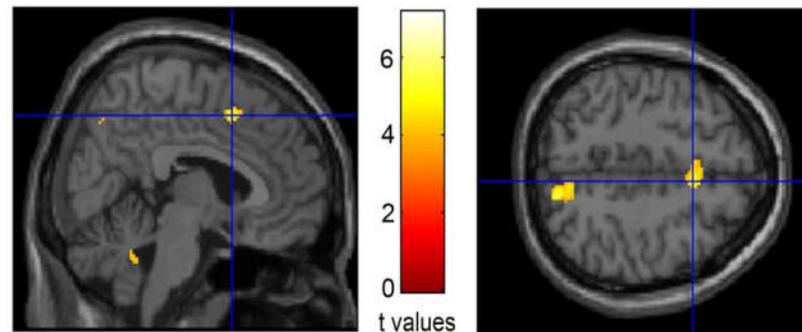
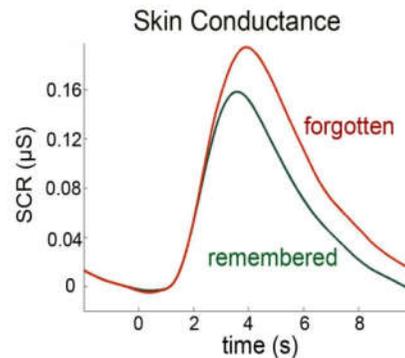
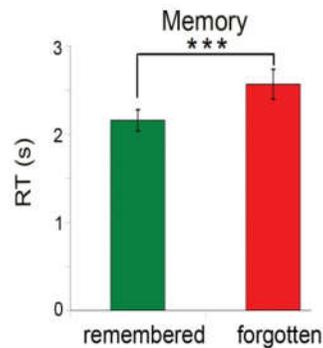


- 18 healthy subjects
- 150 words (Jung's list, extended)
- Recordings during association: RTs, SCR, fMRI – dependent on later memory

Study 1: Free association to word list (Jung's paradigm in the scanner)

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Which free associations can not be consciously remembered afterwards?



$p_{FDR} < .05$

- RT \uparrow \rightarrow resistance?
- SCR \uparrow \rightarrow autonomic arousal

ACC \uparrow \rightarrow conflict processing?

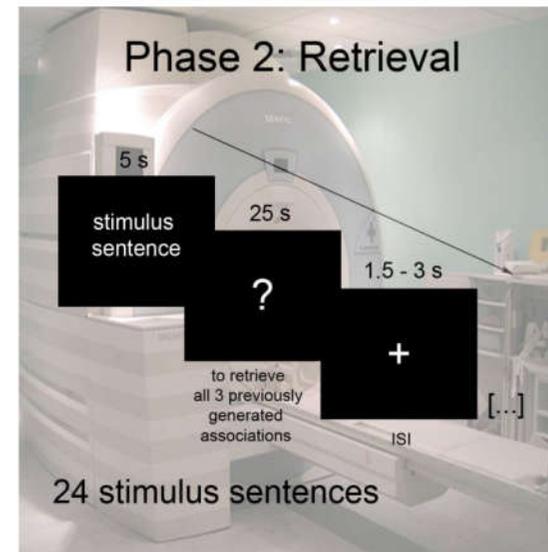
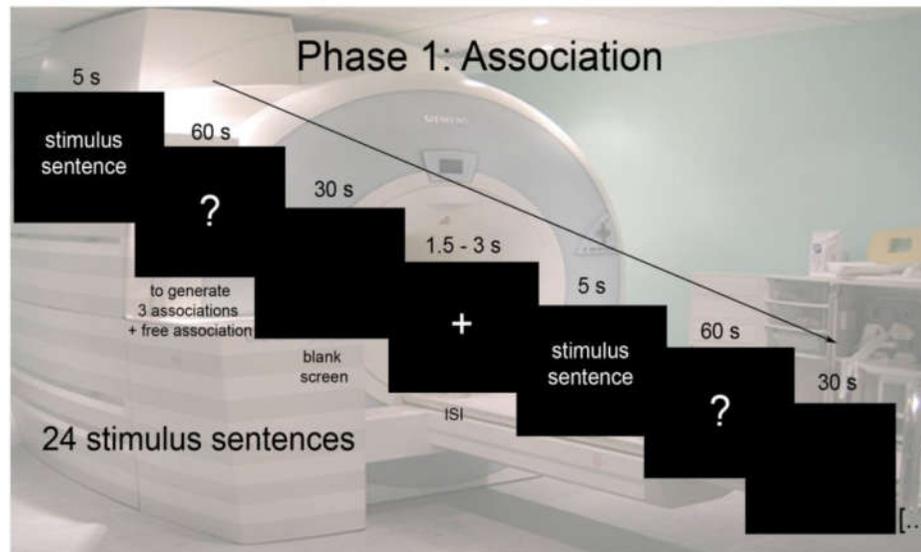
Study 1: Free association to word list (Jung's paradigm in the scanner)

Control analyses for relationship between RT/SCR and memory

- Response entropy (effect can be partialled out)
- Word length (no effect on memory)
- Word frequency (no effect on memory)
- Semantic similarity (no effect on memory)
- Semantic relatedness (no effect on memory)
- Subjective valence (no effect on memory)
- Subjective arousal (no effect on memory)

But are these words really related to conflicts?

Study 2: Free association to conflict sentences



Two major changes

- stimulus sentences: neutral, negative or conflict-related
- naming of 3 words, then 1 minute of free association

Study 2: Free association to conflict sentences

6 **neutral** sentences:

“I try to follow the news on a regular basis“

6 **negative** sentences:

“I am afraid sometimes when I'm walking alone in the dark“

12 **conflict-related** sentences:
typical psychodynamic
conflicts

conflict sentences: desire for care vs. autarchy (passive)

All my life I got a raw deal.

I wish that finally someone is taking care of me.

I have the feeling that I always get too little.

I actually only feel good when someone is taking care of me.

conflict sentences: desire for care vs. autarchy (active)

I give so much, without getting really rewarded.

I cannot say “No” if someone else is asking me for help.

I do not need nothing or anybody to be happy.

I hate it to be a burden for other people.

conflict sentences: self-value

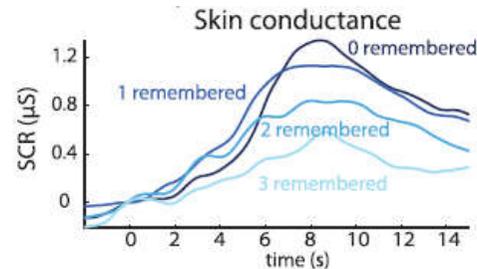
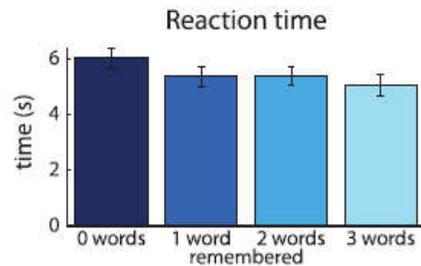
Usually I have a very low self esteem.

I am often embarrassed about myself.

Sometimes I am disgusted by myself.

I often estimate myself as little competent.

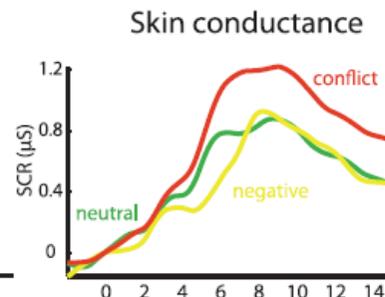
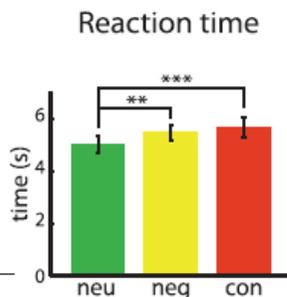
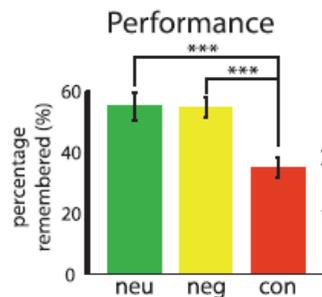
Study 2: Free association to conflict sentences



Free associations that cannot be remembered later

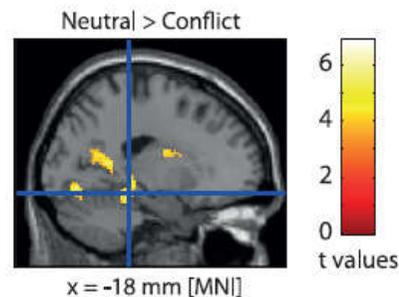
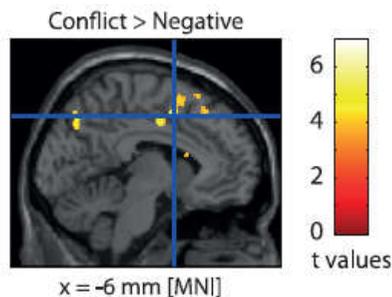
RT \uparrow (resistance?)

SCR \uparrow (arousal)



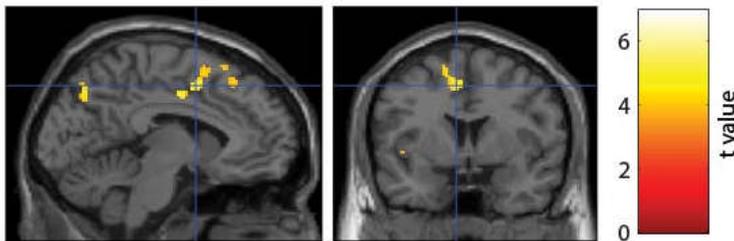
Associations to conflict sentences:

- RT (\uparrow) (resistance?)
- SCR \uparrow (arousal)
- Memory \downarrow (repression?)
- ACC \uparrow (conflict?)
- hippocampus (\downarrow) (memory)



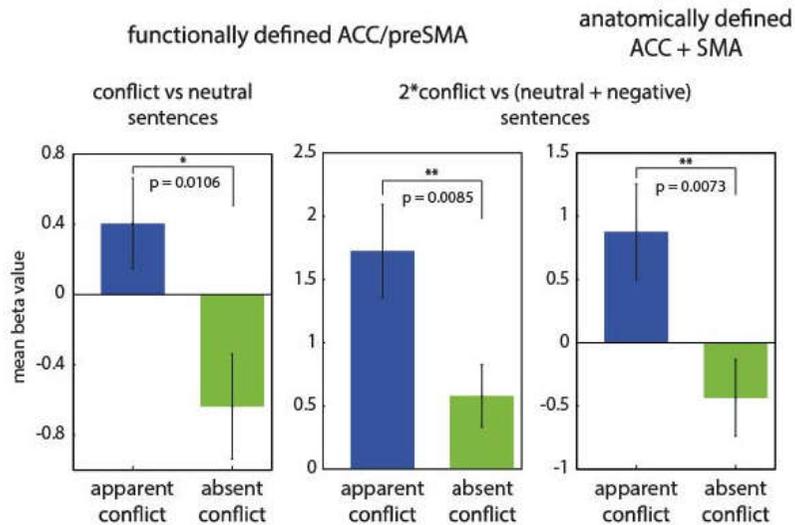
Study 2b: Free association to conflict sentences: personal relevance?

A Conflict > negative sentences across all subjects
ACC / preSMA cluster used as ROI



MNI coordinates of maximum activation within cluster: -6 / 4 / 48

B Beta values of functionally and anatomically defined ACC/SMA region compared between groups



Are the conflicts personally relevant?

- Analysis of free associations by two psychodynamic therapists: evidence for relevant conflict based on subjective reactions?
- Possible conflicts in 23/209 associations (8/18 subjects)
- Free associations to personally relevant conflicts

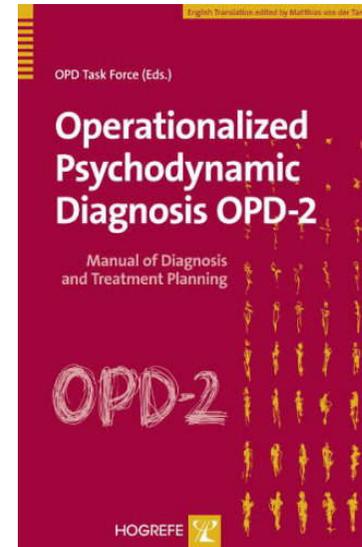
→ SCR ↑

→ Ratings: mood ↓, valence ↓, agreement ↑

→ ACC ↑

Still – these conflict sentences are not autobiographically derived

Study 3: Free association to autobiographical conflict sentences



Assessment of individualized conflicts: OPD interviews

- OPD: Operationalized Psychodynamic Diagnosis
- Diagnostic tool beyond DSM/ICD: based on psychodynamic theory
- Background: e.g., Core Conflictual Relationship Theme (CCRT; Luborsky et al.)
- Axes: perception of disease, relationship patterns, **main conflict**, structural pathology

Study 3: Free association to autobiographical conflict sentences

TABLE 1 | Overview of OPD conflicts (derived from OPD-Task-Force, 2008).

	Brief description
C1 Individuation vs. dependency	Existential importance of attachment and relationship. Relationship is oscillating between extremes of yearning for close relationship and symbiotic closeness (dependency), and striving for explicit independence and marked distance (individuation). (. . .) Seeking of closeness and attachment at all cost, versus exaggerated independence and forced avoidance of attachments.
C2 Submission vs. control	The central motive is to dominate the other, or to submit to the other. Open or latent aggressive impulses play a central role. Submission and control are non-adaptive extremes on the continuum of being able "to be guided," or "to guide others," respectively. Behavior norms, and other personal and societal rules are given a high value.
C3 Desire for care vs. autarchy	Desire for care versus autarchy refers to the fundamental need of individuals to obtain something, to be assured of attention and care, or to give attention and care, as opposed to not needing any care. (. . .) Loosing something or someone plays a central role as a trigger situation.
C4 Conflicts of self-value	Self-worth versus object worth as the extreme poles of the theme "being able to question oneself," and "to attach a value to oneself." Subjects consider themselves constantly inferior or superior in regard to others and can't find the right balance between those extremes. The conflict may show as a trait ("narcissistic personality").
C5 Guilt conflicts	Constant tendency to attribute blame to others or to blame oneself; excessive taking of responsibility, or shifting of guilt and responsibility onto others.
C6 Oedipal sexual conflicts	Difficulties in self-value considering specifically the role as a woman or man. The extreme poles are characterized by rivalry versus identification with gender-specific roles, wanting to be someone as a woman or man versus keeping in the background, being able to enjoy sexual pleasure versus sexual abstinence.
C7 Identity conflicts	Delineable, but contradictory self-representations ("identities"), chronic struggle for identity and well-being, concealment of identity dissonance.

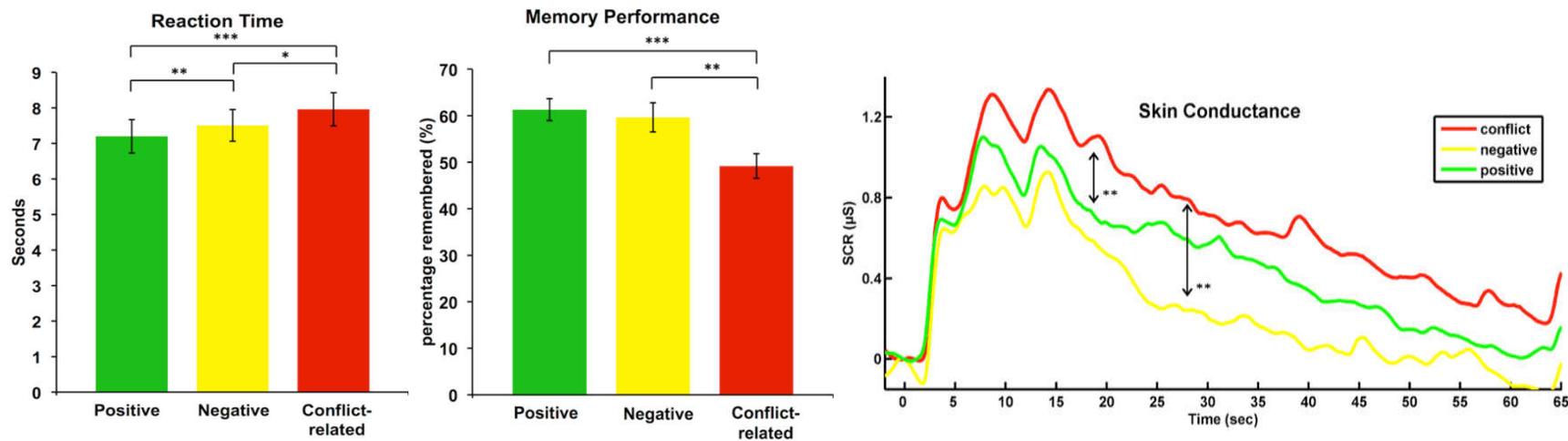
Study 3: Free association to autobiographical conflict sentences

TABLE 3 | Frequency of conflict themes (rows) and number of conflict themes per subject (columns).

		(1) Conflict	(2) Conflict	(3) Conflict	<i>n</i> each conflict
C1	Dependence vs. autonomy	4	6	0	10
C2	Submission vs. control	7	2	0	9
C3	Desire for care vs. autarchy	9	2	0	11
C4	Conflicts of self-value	8	7	1	16
C5	Guilt conflicts	0	2	0	2
C6	Oedipal sexual conflicts	1	0	0	1
C7	Identity conflicts	0	0	0	0
		<i>n</i> total	<i>n</i> total	<i>n</i> total	
		29	19	1	

- 6 autobiographical conflict sentences
- 6 autobiographical negative sentences putatively NOT related to conflict
- 6 autobiographical positive sentences

Study 3: Free association to autobiographical conflict sentences



- Conflicts: RT (\uparrow), SCR \uparrow , memory \downarrow
- Subjective ratings of feelings and arousal cannot explain conflict effects

Repression and free association: Summary

Free association to later forgotten vs. remembered words or sentences

- Study 1: RT ↑, SCR ↑, ACC ↑
- Study 2: RT ↑, SCR ↑

Free association to conflict vs. negative/neutral sentences

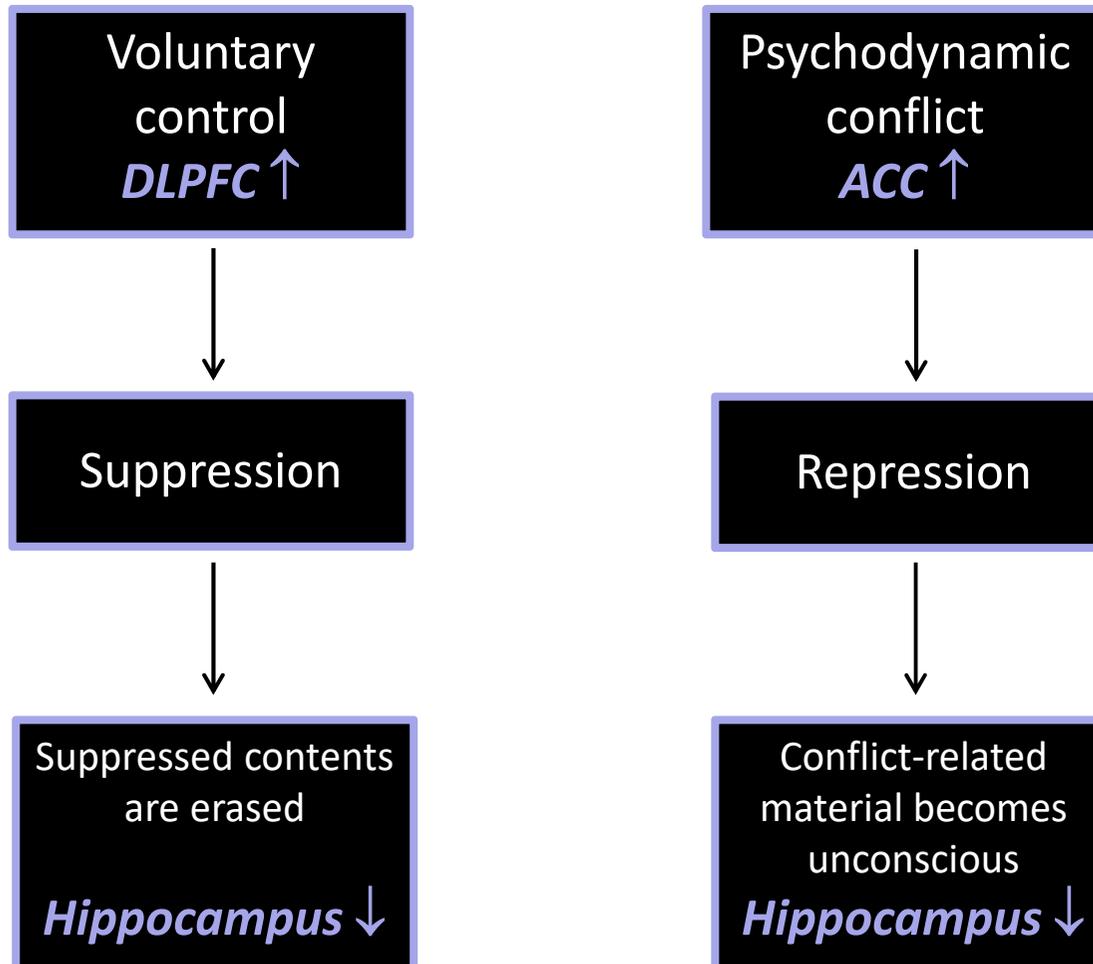
- Study 2: RT (↑), SCR ↑, memory ↓, ACC ↑, hippocampus ↓
- Study 3: RT ↑, SCR ↑, memory ↓
- Study 4: RT ↔, SCR ↔, memory ↓

Free association to personally relevant vs. irrelevant conflict sentences

- Study 2b: RT ↔, SCR ↑, memory ↔, ACC ↑, hippocampus ↔
- Study 4: RT ↑, SCR ↔, memory ↔

Reliable general effects, less pronounced effects of personal relevance

Voluntary suppression vs. repression



Overall summary

Voluntary memory suppression in the directed forgetting and think/no-think paradigms

- Can permanently reduce the accessibility of memories
- Occurs for various kinds of material
- Depends on interactions between lateral PFC and hippocampus

Repression in the free association paradigm

- Occurs specifically for conflict-related material
- Is related to increases in SCR and RT during free association
- Depends on interactions between ACC and hippocampus

Does repression lead to paradoxical (rebound) effects?

Bochum Neuropsychanalysis Group

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