CHAPTER TEN

Changes in dreams of chronic depressed patients the Frankfurt fMRI/EEG study (FRED)

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Introductory remarks

In this chapter we are summarising changes in dreams in a patient investigated in the on-going FRED study. With this single case we would like to illustrate our attempt to combine clinical and extraclinical (experimental) research in the large on-going LAC depression study.[1] Marianne Leuzinger-Bohleber has reported the changes of dreams as one indicator for therapeutic changes from a clinical perspective in Chapter Five. The same patient, part of a sub-sample of the 380 chronic depressed patients[2] recruited in the LAC depression study, was willing to spend the necessary two nights in the sleep laboratory of the Sigmund Freud Institute because investigating his severe sleeping disturbances was of clinical importance. His severe sleeping problem, shared with many of the patients, is one of his most burdening symptoms and indeed the EEG data elicited showed pathological sleep patterns such that he had to be referred to a medical expert for sleep disturbances, who prescribed him the necessary medications to improve his sleeping behaviour. We are thus investigating several patients of the LAC study also by EEG and fMRI and will publish additional single case studies

as well as the results of the group comparisons between the changes in dreams of these patients and a non-clinical control group.

As a result of this "therapeutic intervention" in the sleep laboratory we were able to compare his dreams obtained there with those reported in psychoanalysis, giving us the unique opportunity to compare changes in dreams obtained "naturalistically" in psychoanalytic treatment with those dreams collected in the frame of an experimental sleep laboratory[3].

In this chapter we can only give a short overview of a model of the generation of dreams developed by Moser and von Zeppelin (1996)[4]. This is the theoretical background for our hypotheses looking at changes of dreams in depressed patients, applying a coding system for investigating the manifest dream content based on this model (see 1). In a second part of this chapter we briefly summarise some arguments for investigating psychoanalytic changes also by neurophysiological measures, and our attempt to develop the experimental design of the FRED study (2). We then focus on the description of the single case study contrasting the experimental findings of the changes in dreams from the sleep laboratory with those reported in psychoanalysis (3 and 4).

1 *Dream and depression*

Dreaming is described in contemporary dream research as a thought process, engaging our inner system to process information (Dewan, 1970). Inner (cognitive) models are constantly being modified in coordination with what is perceived. In contrast to a dreaming state the reactions to our environment are immediate while we are awake, thus enabling information to be consolidated into memory with one constraint, namely that consolidation processes are not always possible due to capacity restrictions of the system. Consolidation processes do continue, though, during sleep, in an "offline" modus, thus enabling integration to long-term memory (Esser, Hill & Tononi, 2007; Louie & Wilson, 2001; Vyazovskiy et al., 2011).

According to Moser and von Zeppelin (1996)[5], psychoanalysts and dream researchers at the same time, so-called "dream complexes"—activated by current events, process the entirety of information from unsolved conflicts and traumatic situations while dreaming. The dream searches solutions or rather best possible adaptations for these dream complexes. A dream, which is usually pictorial, consists of at least one situation produced by a "dream organiser". Dream organisation may

be considered—according to Moser—as a bundle of affective-cognitive procedures, generating a micro-world—the dream—and controlling its course of action. Within this system the "dream complex" may be considered as a template facilitating dream organisation.

Thus it may be assumed that a "dream complex" originates from one or more complexes stored in long-term memory, rooted in conflictive and/or traumatising experiences, which found their condensates in *introjects*. They are closely related to triggering stimuli from the outside world, which are structurally similar to stored situations of the complex. The searched-for solution of the complex is governed by the need for security and wish for involvement, i.e., the *security principle* and the *involvement principle* which govern dream organisation.

Wishes within these complexes are links between self and object models and RIGs (i.e., representation interaction generalised), which are accompanied by convictions and a hope for wish fulfilment. Conflictive complexes are areas of bundled wishes, RIGs, and self and object models with a repetitive character, thus creating areas of unbound affective information. Affects within such an area are interconnected by k-lines, which are blocked and thus not localised. In order to solve these conflictive complexes it is necessary to retrieve this affective information into a relational reality to make them come alive (Fig. 1). This is

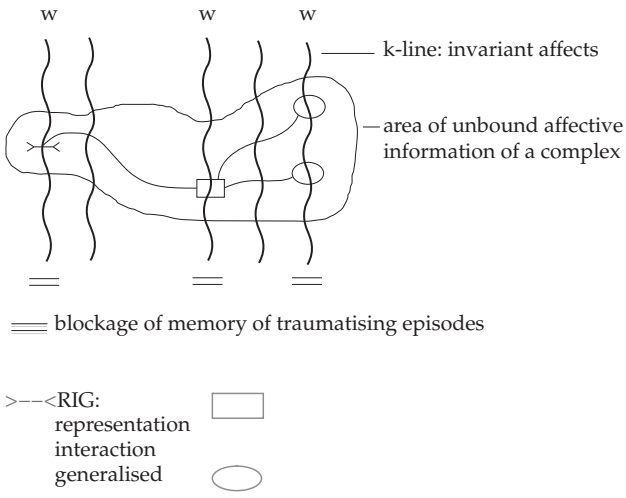

Figure 1. Memory model of conflictive complexes according to Moser and von Zeppelin (1996).

being attempted in dreams whose function it is to search for a solution of the complex. This search for a solution within a dream is governed by the above-mentioned need for security and wish for involvement, i.e., the *security principle* and the *involvement principle*. The following illustration may serve as an elucidation of this model.

2 *When psychoanalysis engages in a fruitful relationship with neuroscience: some theoretical considerations, the design of the FRED study and first observations*

FRED (Frankfurt fMRI/EEG Depression Study)[6] is an example of a fruitful combination of two domains—psychoanalysis and neurosciences. This very ambitious project currently conducted at the Sigmund Freud Institute (SFI) and BIC (Brain Imaging Centre) in cooperation with the MPIH Frankfurt (Max Planck Institute for brain research),[7] is looking to investigate changes of brain functions in chronic depressed patients after long-term therapies, aiming to find multimodal neurobiological changes in the course of psychotherapies.

When looking at depression from a brain physiological angle, some interesting findings have been put forth: for instance, that depression is related to a neurotransmitter disorder, or a frontal lobe dysfunction (Belmaker & Agam, 2008; Caspi et al., 2003; Risch et al., 2009). Northoff and Hayes (2011) have convincingly put forth that the so-called "reward system" is disturbed in depression and that there is evidence that deep brain stimulation can improve severe depression.

But despite all these findings no distinct brain physiological marker for depression has been found so far. From this it seemed plausible to pose the research question of whether changes in the course of therapy have brain physiological correlates, which we are currently investigating in FRED.

Generally speaking, psychotherapists—especially psychoanalysts—work with what can be remembered and with recurring—usually dysfunctional—behaviours and experiences. We assume that this has some precipitations within the brain in some way or the other, like synapse configuration, priming, axonal budding, and more, giving ground to the hypotheses of FRED that (1) psychotherapy is a process of change in encoding conditions of memory, and (2) elements of memories can be depicted in fMRI by a recognition experiment of memories related to an underlying conflict. This constitutes the neuro-psychoanalytic aspect of

the FRED study, of which some preliminary results will be given in the following material. Another aspect of change relevant for our study is that of clinical change found in dreams in the course of psychotherapy. The analysis of dreams with the specific method of Moser and von Zeppelin (1996)—as will be outlined—enables us to compare empirically elicited findings with clinically reported ones from the therapist. Results of this will be given in parts 3 and 4 of this chapter.

To investigate our hypotheses we recruited chronically depressed patients, with whom we conducted in a first diagnostic phase for one an operationalised psychodynamic diagnostics (OPD) interview concentrating on axis II (relational) and a dream interview (see Table 1 below). From these two interviews the stimuli for the fMRI scanning are created individually for each patient[8]. For one, dream words are taken from a significant dream elicited in the dream interview and for the other confrontational sentences taken from the OPD interview are formulated. Brain activation patterns resulting from these stimuli in the fMRI serve as dependent variables (DV, see Table 2). Measurements are taken at three different time points revealing changes in activation patterns occurring in the course of therapy.

Thus far we have recruited ten chronically depressed patients (from PA group; cf. Table 2), of which we have obtained so far seventeen dreams (T1 + T2).

Assuming that a dream is a linguistically coded memory it—being a significant one—will contain some conflict-laden material. It will have portentously emotional qualities, which will be related to the primary dream process, and dream words will have a different quality from words taken from an "all-purpose story".

Table 1. Time schedule and measurement points within FRED.

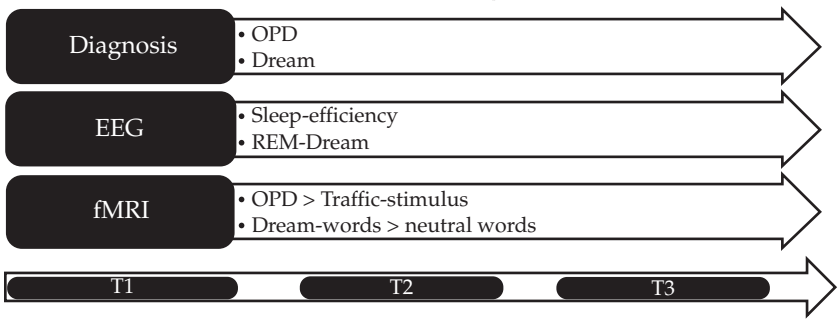

Table 2. FRED design—one-factorial design with repeated measurement and control-group. PA: Psychoanalytic treatment group; CBT: cognitive-behavioural treatment group.

	Factor A: Type of therapy		
	Patient	Patient	Control
DV	PA	CBT	—
Sleep efficiency	a_1	a_2	a_3
REM dream	b_1	b_2	b_3
Dream words	c_1	c_2	c_3
Interaction conflict	d_1	d_2	d_3

We assume that in the fMRI those dream words when recognised will reactivate dream-specific encoding conditions in specific brain areas. This memory recognition task with dream words is the dream experiment part of FRED.

In fact, results of our dream experiments revealed that patients confronted with dream words in contrast to so-called neutral words (taken from an all-purpose story) showed differential activation of the precuneus, the ventro-lateral pre-frontal cortex (VLPF), and the anterior cingulate gyrus, among others. These three brain areas are known to be involved in self processing operations (experience of self agency), generation of basic causal explanations, and regulating emotions (see also below), where the ACC is also known for its conflict monitoring feature.

In the course of therapy we could show that the recognition or rather re-sounding of initially significant dream content at the beginning of therapy activated specifically the precuneus and the left parietal lobe, which did not substantiate after one year of therapy. The disappearance of these areas—which are involved in attention processes but are also significant to emotional processing by the self—at T2 allude to the supposition that possibly the dream content has lost its special importance and is experienced now in the same manner as the neutral story (cf. Fig. 2).

As for the OPD part of FRED, it consists of three conditions in the fMRI scanner, which are repeated six times each. In condition 1 four subjectively confrontational (conflict-oriented) statements extracted from the previously conducted OPD interview (relational axis II) are presented consecutively in the fMRI scanner on a screen. In condition

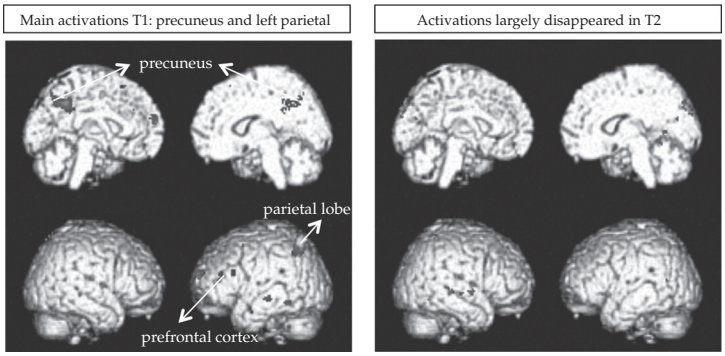

Figure 2. T1 and T2 comparison of dream word recognition in a single case.

Table 3. The three conditions of stimulus presentation in the fMRI.

	Condition 1	Condition 2	Condition 3
1.	Most of the time I had to control myself and to manage by myself	A traffic participant is acting wrong	Think of a safe place
2.	Now I feel very lonesome and need someone to take care of me	You are annoyed with him	Relax
3.	I can bear closeness only badly and	You react	Get your head free
4.	Don't think that anyone is really interested in me	He reacts inappropriately	Don't think about anything

2 subjects see four statements of an all-purpose situation presented in the same manner, and finally condition 3 is composed of four relaxation statements (cf. Table 3).

Analysis of the fMRI brain scans contrasting the different conditions (dysfunctional sentences > traffic + relaxation) revealed specific activation patterns again in the precuneus, and above that of the posterior and anterior cingulate gyrus, medial prefrontal cortex (MFC), occipital cortex and the left hippocampus for condition 1 (dysfunctional sentences). The occipital cortex and precuneus are important brain structures

for primary visual processes (occipital c.) and visual-spatial imagery (precuneus). But besides this the precuneus is also known to be an important brain area for episodic memory retrieval and self-processing operations, i.e., for first person perspective taking and experience of agency. The cingulate gyrus being an important part of the limbic system helps regulate emotions and pain and constitutes an important feature of memory just like the hippocampus, which is aligned for memory formation, specifically long-term memory (episodical biographic). The MFC is postulated to serve as an online detector of information processing conflict (Botvinick, Cohen & Carter, 2004) but also has a regulative control function of affective signals (Critchley, 2003; Matsumoto, Suzuki & Tanaka, 2003; Posner & DiGirolamo, 1998; Roelofs, van Turennout & Coles, 2006; Stuphorn & Schall, 2006).

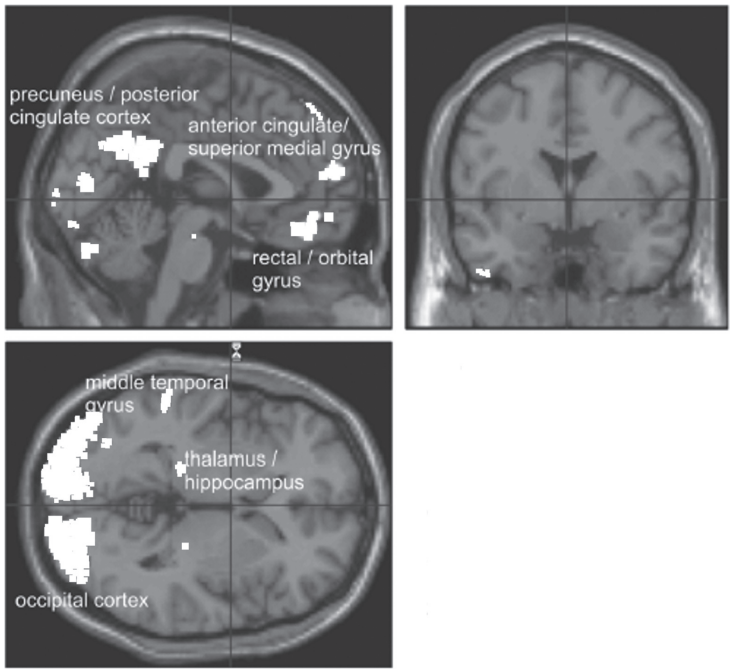

Figure 3. fMRI scans contrasting dysfunctional sentences (condition 1) > traffic (condition 2) + relaxation (condition 3). Second level analysis $p < 0.05$, FDR corrected; N = 13 Mr W. experienced two further separations from his ill mother, but these incidents had proved less traumatic since he had been taken in by relatives.

In a single case study we could also show that MFC activation could no longer be detected after one year of psychotherapy, suggesting that the conflict impact has diminished in the course of therapy.

In summary, data from both domains—neurobiology and psychoanalysis—strongly suggest that emotionally meaningful life experiences are encoded in memory by sensory percepts that were registered during the life experience that they encoded. These encoded memories will recur in dreams, as both dreams and memory tap the same brain areas. Therefore dreams can no longer be considered as randomly generated, not conveying any meaning.

Within the FRED study, dreams were not only studied from a neurophysiological perspective but also from a psychoanalytical standpoint, by analysing the manifest dream using a specific method—namely the Moser method. This method has its basis in the analysis of dreams under problem solving aspects, which strongly relies on affect regulation, since the success or failure to resolve a conflictive complex, assumed to be underlying the dream, will, ultimately, be determined by it. Analysis is done by scrutinising the manifest dreams for certain aspects, among others: elements positioned within the dream world, observable interactions taking place between self and others or the absence of them and interruption of dream scenes, which allude to affective overflow making such interruptions necessary. The following describes the dream coding system of Moser and von Zeppelin as it was used here.

The dream coding system of Moser and von Zeppelin

The dream coding method of Moser and von Zeppelin (1996) is an evaluating system used to analyse the dream material based on their model of cognitive-affect regulation, using formal criteria to investigate manifest dream content and its changing structures.

According to Moser and von Zeppelin the regulating processes of dream organisation are based on:

Positioning elements into the dream world
Monitoring the dream activity
A working memory containing (affective feedback) information of each dream situation and its consequences, and
Regulating procedures responsible for changes.

Formal criteria and structures of a dream are: the number of situations contained in a dream, the type of places and social settings named in a dream (descriptions, attributes), objects occurring (descriptions, attributes), placement, movement, interactions of objects as well as the question of whether the dreamer himself was involved in interactions, or if he remains spectator, and finally the ending and beginning of a situation (how, when).

The dream coding system aims at making these structural aspects of dreaming transparent in order to better understand the affect regulation processes taking place.

Two principles of affect regulation are assumed: (1) the security principle and (2) the involvement principle. The former becomes transparent through "positioning" and the latter through "interactions". These two principles are moderated via trajectories (movement traces) leading from a positioning to an interaction or out of an interaction back to a position. Common to both principles is their ruling by negative and positive affects, i.e., anxiety is the motor for an enlargement of security, also regulating involvement by, for instance, breaking off interactions and generating a new situation. Likewise hope is active in the security as well as in the involvement principle. It is assumed that problem-solving can only take place and be tested in interaction; therefore the dream tends towards interaction.

To facilitate transparency of the coding three columns are being used: (1) the positioning field (PF), (2) the field of trajectories, and (3) the interaction field (IAF). The positioning field contains all objects or rather cognitive elements (CE) as well as their attributes and their position. In the field of trajectories all movements of objects and CEs are coded and interactions are coded in the interaction field column specifying changes to the self, reaction relations, and response relations of the objects while specifying whether they are happening to the dreamer himself or to others or are only observed by the dreamer.

It is assumed that the more elements used in the dream scene (mirrored in different subjects and objects summarised in the positioning field), the more possibilities are available for the dreamer to regulate his affects and contents processed in the dream. If the dream remains in the positioning field, security aspects dominate, indicating that the dreamer is hesitant to get involved in interactions. Codes appearing in the second column, i.e., field of trajectories, signify what has been named by the authors "loco time motion" (LTM) and indicate preparations for interaction that will follow. These interactions can be

summarised as changes that develop during evolvement of a dream scene without interrupting the scene. Finally, all types of interactions are summarised in the third column, the IAF: codes in this column signify the ability of the dreamer to get involved with others, even if the interaction might fail or end in a destructive way.

A fourth element normally ignored by dream researchers is the so-called "interrupt". It comprises all kinds of abrupt endings or interruptions of the dream situation, but also cognitive processes (CP) like commenting on a dream situation in an emotional or cognitive way may to some extent create a distance and interrupt the dream experience.

The following clinical case with analyses of a series of four dreams elicited in the laboratory in the first two years of therapy of the patient highlights how clinical and experimental data together give an exciting insight into changes occurring in the course of treatment.

3 Clinical case: analysis of a dream series in the course of therapy

Biography and trauma history

Marianne Leuzinger-Bohleber describes the clinical and biographical background of this patient extensively in chapter 5 of this book. She illustrates how the manifest dreams as well as the dream work changed during psychoanalysis from her clinical perspective and also reports on the transformation of the inner (traumatic) object world. In this chapter we would like to contrast her clinical views with a more systematic investigation of the changes in the manifest dreams.

Just a short summary of the clinical material here:

The patient explained in the assessment interviews that he had been suffering from severe depression for the last twenty-five years, and that he is coming to our Institute because after the last depressive breakdown he had submitted an application for retirement pension. The doctor who assessed his application concluded that he did not require a pension, but an "intelligent psychoanalysis", initially a response Mr W. found highly insulting. He felt that he had not been taken seriously, especially his substantial physical symptoms: the unbearable pains covering his entire body, his acute eating disorders, as well as his acute suicidal tendencies. Furthermore, the patient suffered from severe sleep disorders. Often he is unable to sleep at all. As a rule, he wakes up after one and a half hours, or after three hours at the most. He feels physically exhausted and is barely able to concentrate his mind on anything.

Mr W. had already undergone several unsuccessful attempts at therapy, including behavioural therapy, Gestalt therapy, "body therapy", as well as several indoor treatments in psychiatric and psychosomatic clinics. He is among that group of patients for the most part apparently unable to respond to psychotropic drugs, and whose relapses occur at ever-shorter intervals and with increasing intensity. After many consultations with various psychiatrists and neurologists, he then discovered that only Lyrica[9] helped him to more or less deal with his states of physical stress and anxiety attacks.

The patient is an only child. One of the known details about his early history is that he was a "cry-baby". When he was four years old Mr W.'s mother fell seriously ill. W. was admitted to a convalescent home for children, evidently founded on authoritarian, inhumane educational principles reminiscent of National Socialist ethos. Just how traumatic an experience this stay in a home was is something that became transparent during psychoanalysis. Mr W.'s first childhood memories revolve around the following event: he recalls how his father took him by the hand and led him out of the home. He also recalls how a girl had been forced to eat her own vomit.

Mr W. experienced two further separations from his ill mother, but these incidents had proved less traumatic since he had been taken in by relatives.

In spite of the dissociative states following the traumatic separations and his social isolation, W. was a good pupil, who went on to complete his first apprenticeship training and later his university studies. During adolescence, he had a psychosomatic breakdown, which the parents diagnosed as a "crisis in growing up". At the age of fifteen years, he met his first girlfriend. His condition improved. At the age of twenty-two he separated from his first girlfriend because he fell in love with another woman. Although the separation ran in his favour, he reacted very severely to it. He also initiated the separation from his second girlfriend, though suffered for weeks due to the separation. After entering another relationship he was dramatically overcome by a nervous breakdown during a party held by his new girlfriend: he had to be taken to hospital due to hyperventilation (panic attacks).

As already mentioned, Mr W. had undergone several psychotherapies. Although all his therapies alleviated him, "none of them cured him". His depressions became worse and worse and became chronic.

Dream series elicited in the dream laboratory

In the following a total of four dreams—two from the end of the first year of therapy and two elicited one year later—will be analysed for changes in the course of therapy using the Moser method.

Dream 1—end of first year of treatment

> I am standing on a bridge over a dam. Right and left are steep slopes—mountains (S1). There is a landslide. I see the slope and an entire house approaching me very fast, rapidly sliding, rushing towards me (S2). I think to myself that I will not be able to escape it (/C.P./). I am running (S3) and am amazed at how fast I can run (/C.P./). I succeed in saving myself from the rapidly descending house (S3). I am in safety at the edge of this bridge (S4).

In order to analyse this dream with the Moser method each and every element of a situation is given a code in the respective column of either the positioning field (PF), the field of trajectories (LTM), or the interaction field (IAF):

Sit.	PF	LTM	IAF
S1	SP PLACE (dam) CEU_1 (bridge) CEU_2 (mountains) ATTR (steep)		
S2	SP PLACE (slope) CEU_3 (house)	LTM CEU_2 1 ATTR	
/C.P./			
S3	SP CEU_3 ATTR (rapidly sliding)		IR.C
/C.P./			
S4	SP CEU_1		IR.S

From here the dream may be analysed as follows: the first situation of this dream (S1) is coined by the security principle—many cognitive elements are simply being placed. But it also hosts a multitude of involvement potential as many attributes are being named for the elements placed. In the second situation (S2), a first attempt is made to deal with this potential—albeit rather limited (LTM)—but again increasing potentiality by adding another attribute (ATTR). As a result the affectivity seems to increase to such an extent that the dream scene has to be interrupted by a comment (/C.P./). In S3 the dreamer finally succeeds in invoking a "*successful*" interaction between the threatening cognitive element (CEU_3 (house)) and himself (SP). Initially this leads to another interruption: the dreamer is surprised by his capabilities, and finally in S4 a cathartic self-changing interaction is conjured up: he is in safety.

In summary, the patient describes a threatening situation, which is initially determined by the security principle. The relatively sophisticated description of the first scene bears potential, which the dreamer makes full use of in order to regulate the threatening affects. The wish to "bring himself to safety" is fulfilled in this dream.

Dream 2—end of first year of treatment

> There are more people in the room. I wear this cap. You three are here and somebody else, who will come up right after me. He has a lot of pretensions. It is morning and I wake up. I wear this cap and am linked up to all those cables (S1). It is lively around me and you and the others are walking around and talking to each other. I pick up on you whispering and being annoyed at someone or making fun of him. The one that you are annoyed at is in the room as well, and he is supposed to get the cap on after me (S2). I remember that I have seen him already once in front of the door of my analyst (S3). He is here in the room and constantly poses pretensions. Everything should be the way he wants it. You are annoyed that you have to fulfil these wishes (S4). I think to myself: "Just take it easy" (/C.P./).

Obviously this is a "laboratory dream". The patient uses the research situation as an opportunity to regulate his anxieties to be "too pretentious". He projects this into an object processor (OP) and by this he himself becomes an observer. Thus he successfully distances himself, which gives him the possibility to comprehend the events in more detail.

The coded version of this dream:

Sit.	PF	LTM	IAF
S1	SOC SET (laboratory) SP ATTR (wired) CEU_1 (cap) OP_1 (G) (researcher) OP_2 (patient) ATTR (pretentious)		
S2	SP OP_3 (researcher) 1 ATTR AFF OP_1 (G) 1 ATTR AFF OP_2 CEU_1 IMPLW	LTM OP_1 (G)	
S3	SP OP_2 OP_4 (analyst) IMPLW		
S4	SP OP_2 1 ATTR PLACE (room) OP_1 (G) 1 ATTR AFF CEU_2 (wishes)		IR.D ((IR.C res $OP_2 \rightarrow OP_1$ (G))) ATTR AFF OP_1 (G)
/C.P./			

In the first situation (S1) there is a lot of potential to regulate affects—albeit still governed by the security principle. It includes a social setting (SOC SET), variable attributes (ATTR), and a lot of processors inviting action. By placing another patient (OP_2) into the dream scene the dreamer (subject processor SP) gets the opportunity to take an observational stance, which leads in S2 to a movement (trajectory LTM) of the OP_1 group of researchers.

It remains unclear whether S3 may be considered to be a dream scene at all or whether it should be considered to be an interruption containing

a cognitive process (/C.P./). No matter what, it is regulated by the security principle. The potential existent in S2 (LTM) cannot be exploited in S3. In S4 finally this is successful in that an interaction takes place just to disembogue in another interruption. The affectivity of the situation increases to such an extent that it has to be interrupted: the dreamer cautions the object processor (OP_2) or rather himself "to take it easy".

Dream 3—second year of treatment

> A Formula 1 race with Michael Schumacher (S1). Directly after the race he flies to Germany, in order to inaugurate a bridge (S2). Totally bonkers (/C.P./). He is in Germany and inaugurates the bridge (S3). He speaks with a few people sitting at a table. I am sitting at the next table and observe him and the others in debate (S4). How do I come up with something like this (/C.P./)?

The coded dream:

Sit.	PF	LTM	IAF
S1	SOC SET (Formula 1 race) SP OP_1 (Schumacher)		
S2	SOC SET (Formula 1 race) SP OP_1 CEU_1 (bridge)	LTM OP_1	
/C.P./			
S3	SP OP_1 CEU_1 PLACE (Germany) POS REL		IR.C $OP_1 \rightarrow CEU_1$
S4	SP OP_1 OP_2 (G) CEU_2 (table) 2 POS REL		IR.D ((IR.C. resp OP_1 OP_2 (G)))
/C.P./			

Here again the dreamer takes an observational stance. In contrast to the previous dream he succeeds in creating a connecting interaction between two CEs, which is not interrupted but seamlessly leads into a displacement relation. Although this may still be considered to be a distancing manoeuvre from an affective event, it is not as marked as in the previous dream. The involvement principle is more distinct here than it had been previously. The interruption at the end of the dream is not a rebuke as before, but rather expresses astonishment at what occupies his mind and a (conscious) approximation to the underlying complex may be assumed.

Dream 4—second year of treatment

> I am on the way with my little son. Other children and adults are with us. A boy is there too, who has something against my son. It is summer. It is warm. We are walking along the river banks (S1). We want to buy a wagon or trailer (S2). The children are of different ages. One boy is already eleven or twelve years old. This boy is on edge, because the other children and also my son are so young and they cannot do what he wants them to do, because they are too small for this (S3). Then my mother appears. She sews a button back onto my shirt (S4). I don't know how this fits in (/C.P./). I say: "Just leave this stupid button alone." This unnerves me (S5). I am there to oversee everything. A woman is there too. She is the mother of that boy (S1).

This dream begins with a sophisticated placing of cognitive elements (CE) and a movement relation (LTM). The dream is regulated by the involvement principle from the beginning, which alludes to an advanced therapeutic effect. In all successive situations more interactions appear: connecting as well as self-changing relations of subjects and objects. The self-processor (SP) himself is involved and does not have to retreat into an observing position any more (no IR.D)—he faces his affects increasingly. After S4 triggers an interruption, the dreamer (SP) interactively "fends this off" via a verbal relation (V.R.).

Thus we might assume that the dreamer (SP) progressively deals with the affects underlying the dream complex in an interactive manner and is able to depict them in dream scenes. The affects are no longer

The coded version of this dream:

Sit.	PF	LTM	IAF
S1	SP OP1 (son) OP2 (G) (children) OP3 (older boy) OP4 (mother of the older boy) PLACE (river bank) ATTR	LTM	
S2	SP OP1 (son) OP2 (G) (children) OP3 (older boy) OP4 (mother of the older boy) PLACE (river bank) ATTR CEU1 (wagon)		IR.C int (we want to buy a wagon)
S3	SP OP1 (son) OP2 (G) (children) OP3 (older boy) ATTR (age) ATTR AFF (unnerved)		IR.S OP3
S4	SP OP5 (patient's mother) CEU2 (button) CEU3 (shirt)		IR.C OP5 → CEU
/C.P./			
S5	SP OP5 (patient's mother)		V.R.

isolated—which implies that previously isolated affects of the dream complex can now be integrated.

To illustrate the changes occurring from a more experimental perspective the following graph might seem to be helpful:

There is a clearly recognisable increase in potentials (PF) from T1 to T2, which can be exploited for interaction (IAF). The finding of an enhanced ability to get involved can be seen here from just having looked at the manifest dream.

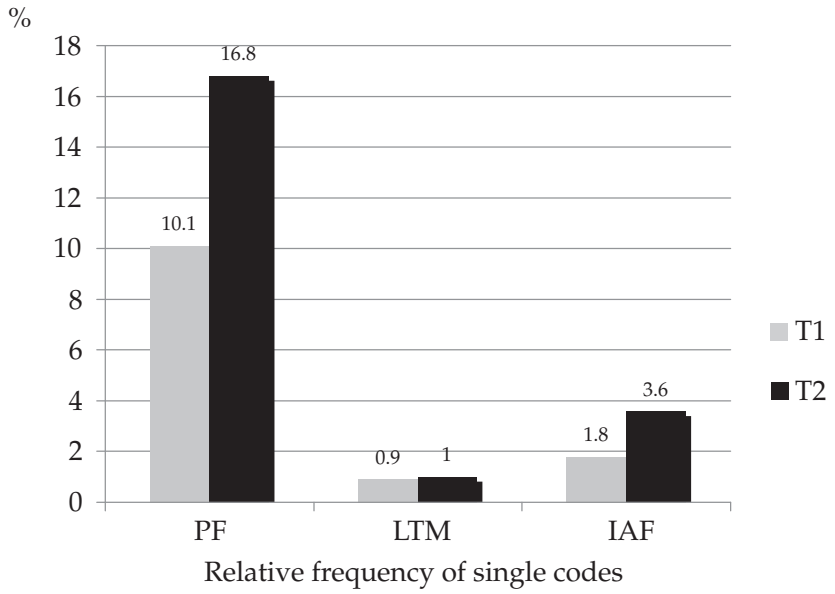

Figure 4. Relative frequency of single codes relativised by the average number of words.

Concluding remarks

In summary, it can be said that via the analysis of the manifest content of Mr W.'s laboratory dream series, by applying a specific empirically validated method (Doell-Hentschker, 2008), we gained insights into his clinical improvement. His laboratory dreams from the end of his first year in therapy were still abundant with anxieties and yearning for security making him hesitant to get involved with others. Nevertheless he already showed in these dreams potentials of what we might consider to be the result of the ongoing therapy, i.e., signs of involvement abilities, in that he could make use of others by projecting his fears into them and *testing* if he could bear the rising anxieties involved in the actions he projected onto them while he still remained in a distant observer position. In the end his fears of getting involved dominated, as he could not yet exploit these potentials.

In the second year of analysis his dreams reveal his enhanced abilities to get involved (dream 4 is largely dominated by the involvement principle from the beginning) and are abundant with

interactions with others portraying his increased ability to face his affects. Rising affectivity is now met albeit still with an *interruption* but followed by a dream scene of a different quality: he fends off his rising anxiety via a more *aggressive* response (V.R. S5 in dream 4) alluding to a progressive approach to the underlying (unconscious) conflict-laden dream complex. Affects are no longer isolated but more and more integrated into existing memory networks.

Let us now compare these *experimental* findings with those reported clinically (see Chapter Five) for their consistency. In the clinical analysis given by M. Leuzinger-Bohleber she applies an analysis of changes in manifest dreams stemming from a former study (Leuzinger-Bohleber, 1987, 1989, p. 324) where she compared manifest dreams in the first and last 100 sessions of five psychoanalyses. This technique is largely based on Moser's memory and affect regulation models, and gave rise to the subsequently developed dream generation model and its coding technique used here in the analysis of the laboratory dreams.

Comparing the clinical dreams from the beginning of psychoanalysis with those of the third year of analysis, she observed changes in the pattern of the relationships, where *the dream subject shows better relationships with others* (e.g., the helping couple in the last dream reported). In the first dreams the dream subject mostly has been alone: no one helped him and smoothed his anxieties, panics, and despair. *The range of actions of the dream subject are increased and the emotional spectrum is enlarged* (in the dreams at the beginning of psychoanalysis we find only panic—in the third year of analysis we also observe surprise, joy, satisfaction, humour, although still anxieties and pain).

There is also a noted change in the dream atmosphere, with the v*ariety of affects as well as its intensities increased and manifest anxiety being less frequent. The dreamer's increased capability to perceive different and even contradictory emotions* become more and more visible. New feelings of anger and rage but also positive affections, tenderness, and sexual attractions appear towards the second year of treatment. The dream subject is no longer a (distant) observer but plays an active part and is involved in intensive emotional interaction with others.

Furthermore, Leuzinger-Bohleber distinguished from the manifest dreams *clearer problem-solving strategies* (more successful than non-successful problem-solving) and a *broader range of different problem-solving strategies*. The dream subject is no longer as inundated as in

a traumatic situation in which he experiences extreme helplessness and lack of power. In his dreams he encounters objects willing to help and support him. This seems a very important indicator that the inner object world of the severely traumatised patient has changed (see last dream in the case report, Chapter Five).

The consistencies of the clinical and extraclinical analyses are remarkable, which is from a scientific perspective of utmost relevance. But to be sure the clinical case study still provides greater psychodynamic relevant clinical and structural information, as the extraclinical analysis suffices with the content of the manifest dreams and has no further biographical data at hand with which results could be enhanced. The consistency in the finding on the other hand consolidates the reliability of the clinical case analysis, which substantiates the method of clinical case studies.

To combine clinical and extraclinical research remains a great challenge, particularly in psychoanalytical psychotherapy research. As discussed by M. Leuzinger-Bohleber in the "Preliminary remarks" of her extensive case report (Chapter Five), it is still a strength of clinical research in psychoanalysis to communicate the unique and complex insights gained in intensive psychoanalyses by narratives because many a "truth can only be told and not be measured". At the same time, psychoanalysis, as all "contemporary psychotherapies", is obliged to show the short-term and long-term effects of its treatments to the psychoanalytical as well as to the non-psychoanalytical community. The latter one often requires us to consider the criteria of the so-called evidence based medicine in such effectiveness studies (see the political context of the LAC depression study, www.sigmund-freud-institut.de). An alternative, innovative approach to "prove" therapeutic changes in an "objective way" is to investigate patients during their psychoanalyses by instruments like the EEG and the fMRI (if the patients are willing to undergo these procedures). Mr W., due to his own interest in curing his severe sleeping problems, was willing to be investigated by EEG in the sleep laboratory of the Sigmund Freud Institute, because he was convinced that these data would help him look for help from medical experts in sleeping problems parallel to his psychoanalysis. Mr W. agreed to report his dreams and to collaborate in the LAC depression study. Therefore we had the unique possibility of comparing his laboratory dreams with his dreams as told in his psychoanalytic sessions.

We hope to have illustrated the differences between a clinical use of dreams as one indicator for changes in the inner (traumatic) object world in psychoanalyses, and the systematic, "scientific" investigation of laboratory dreams by the so-called "Moser method". The case report (Chapter Five) focused on the importance of the psychoanalytic context of the dreams, the observation of transference and countertransference reactions, the associations of the patient and the analysand, etc. necessary to unravel the unconscious meaning of the dream. One great advantage of the psychoanalytical clinical "research" on dreams continues to be the understanding of the meaning of a dream in cooperation with the dreamer—the patient. His association, and conscious and unconscious reactions to a dream interpretation still are the criteria to evaluate the "truth" of the interpretation (see, e.g., Leuzinger-Bohleber, 1987, 1989, 2008). To make a long story short: the transformation of the unconscious world (like dreams)—and as products of it the maladaptive emotions, cognitions, and behaviours ("symptoms") of the patient—still remains the final psychoanalytical criterion for a therapeutic "success" based on "true insights" of the patient in his unconscious functioning.

On the other hand this kind of "truth" often remains fuzzy and subjective, at least in the eyes of the non-psychoanalytical, scientific community. Therefore we have seized the unique possibility to analyse changes in the manifest dreams—gathered in a controlled, laboratory situation—by a theory-driven, precise systematic coding system: the Moser method. These analyses have a high reliability—and inter-subjectivity—and thus may convince independent observers or even critics.

Notes

1. In the ongoing large LAC depression study we are comparing the short-term and long-term effects of long-term psychoanalytic and cognitive-behavioural psychotherapies . Until now we have recruited around 380 chronic depressed patients in different research centres: Frankfurt a. M., Mainz, Berlin, and Hamburg (participating research team and methods: see www.sigmund-freud-institut.de).
2. We are studying this subsample of the LAC study in the so-called FRED Study in cooperation wiith the Max Planck Institute for Brain Research (director, Wolf Singer) and the Psychiatric University Clinic Frankfurt (Aglaja Stirn). The FRED Study is, in parts, a replications study of the Hanse-Neuropsychoanalysis Study (Bucheim et al., 2010).

We thank all the colleagues of the Hanse-Neuropsychoanalysis Study for this opportunity and their generous cooperation (for details see www.sigmund-freud-institut.de and Fischmann et al., 2010).
3. We thank Prof. Volk and his team from his sleep laboratory in Hofheim for the productive cooperation.
4. We are grateful to Ulrich Moser for his continuous support and his corrections of our codings of the manifest dreams presented in this paper.
5. Ulrich Moser and Ilka von Zeppelin are fully trained psychoanalysts engaged in interdisciplinary research for decades. Ulrich Moser was professor of clinical psychology at the University of Zurich. Already in the 1960s and '70s he was involved in modelling parts of psychoanalytic theories. By means of computer simulation he tested the logical and terminological consistency of psychoanalytic theories of defence and the generation of dreams. Based on this basic research on dreams he developed his own model of the generation of dreaming as well as a coding system for investigating the manifest dreams. In this chapter as well as in the chapter by Varvin, Fischmann, Jovic, Rosenbaum, and Hau the dream model and the coding system by Moser and v. Zeppelin are applied.
6. Funded by the Neuro-Psychoanalysis Society—HOPE (M. Solms, J. Panksepp, et al.,) and the Research Advisory Board of the IPA.
7. We are grateful to the BIC and MPIH (W. Singer, A. Stirn, M. Russ) and the Hanse-Neuropsychoanalysis Study (A. Buchheim, et al., 2010) and LAC Depression Study for supporting us in an outstanding way.
8. Here we follow the OPD paradigm as described in Kessler et al. (2010). We would like to explicitly thank M. Cierpka and M. Stasch for eliciting and formulating the relevant stimulus sentences from the OPD interviews.
9. Lyrica (generic name: pregabalin) is an anticonvulsant drug used for neurotic pain, also effective for generalised anxiety disorder (since 2007 approved for this use in the European Union).

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