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RESEARCH

Dream interpretation and empirical dream research – an overview of research findings and their connections with psychoanalytic dream theories

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ABSTRACT

The paper confronts psychoanalytic dream theories with the findings of empirical dream research. It summarizes the discussion in psychoanalysis around the function of dreams (e.g. as the guardian of sleep), wish-fulfilment or compensation, whether there is a difference between latent and manifest content, etc. In empirical dream research some of these questions have been investigated and the results can provide clarifications for psychoanalytic theorizing. The paper provides an overview of empirical dream research and its findings, as well as of clinical dream research in psychoanalysis, which was mainly conducted in German-speaking countries. The results are used to discuss the major questions in psychoanalytic dream theories and points out some developments in contemporary approaches which have been influenced by these insights. As a conclusion the paper attempts to formulate a revised theory of dreaming and its functions, which combines psychoanalytic thinking with research.

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Dream interpretation; psychoanalytic dream theories; empirical dream research

Ever since Freud's epochal work *The Interpretation of Dreams* (1900), interpreting or working with dreams has had a central status in psychoanalysis. The theories of the dream and its significance, though, and the use of dreams in therapy, has changed over time, as well as within various psychoanalytic schools. Furthermore, since the discovery of rapid eye movement (REM) sleep a substantial body of knowledge has arisen, as it has in clinical dream research; this knowledge may contribute to a better evaluation of various theories of the dream in psychoanalysis. It appears to me that these often very interesting research findings, in particular from empirical dream research, are still being widely ignored in psychoanalysis, although they can provide interesting aspects for an understanding of dreams and their application in psychotherapy as well as in psychoanalytic theories.

This article seeks to bring together the main themes discussed in relation to dreams in psychoanalysis since Freud and empirical research findings in order to contribute to a further development of psychoanalytic dream theories. First, various conceptions of dreams and their significance, as well as their clinical application in psychoanalysis, are reported, with particular reference to the following questions that have determined the

debate in psychoanalysis since Freud's time as well as issues in empirical dream research: What exactly is the function of dreaming? Does the dream protect sleep, or does it generate solutions for the psychic problems of waking life? Is there a difference between latent and manifest dream content; i.e. does the dream distort the actual unconscious contents, or does it discover them? To that extent, is the dream an encryption of unconscious contents or a comprehensive self-portrayal of the unconscious? Should the dream be considered as a wish-fulfilment, or does it compensate the conscious mindset? Are the dreamer's associations necessary, or does the dream itself not already provide psychological information about the dreamer? Indeed, does the dream have any meaning at all, as psychoanalysis supposes, or is it a form of meaningless neutral gear of the brain? How is the dream to be worked on in therapy? Must the dream be interpreted or made conscious, or does dreaming in itself, even without being made conscious, have a positive effect on the organism?

The focus of this article is not on providing an exhaustive account of psychoanalytic dream theories and their development (see Bohleber 2012; Deserno 1999; Jiménez 2012; Moser 2003; Vinocur Fischbein 2011). The focus is instead on the above-formulated questions, to which empirical and clinical dream research can contribute insights that will be reported below. On this basis, an attempt is made to draw conclusions with regard to various psychoanalytic conceptions of the dream.

Preliminary epistemological considerations

Prior to an account of the theories of dreams, however, it is necessary to discuss the fundamental differences in epistemological interest, as well as methods of knowledge acquisition in both psychoanalysis and empirical research. Psychoanalysis develops its theories about the dream and its significance with the aim of using the patient's dreams to make the unconscious conscious in the context of psychotherapy; in this sense the dream is the royal road to the unconscious. The significance of the dream is (re-)constructed in a dialogical and hermeneutical process in the relationship between the analyst and the patient, so the result is always (inter-)subjective meaning with the goal of fostering therapeutic changes rather than the discovery of a general or objective meaning of the dream, if such a thing were to be possible. Clinical dream research, at least insofar as it takes place within psychoanalysis, seeks empirically to trace these processes of the intersubjective production of meaning and its effects on the therapy. Empirical dream research, however, with its claim to be a nomothetic science, seeks general and objective insights into regular characteristics of the dream and its function for the human organism. Therefore it is specifically not interested in the dream's subjective meaning for the dreamer.

Furthermore, in its fundamental theoretical model, psychoanalysis assumes in relation to the dream's origination the mode of action of a dynamic unconscious, which implies that the dream also contains meanings that the dreamer specifically does not want to know. This dialectic of discovering meaning is not only alien to nomothetically orientated dream research, but also explicitly rejected by it. Interestingly, empirical dream research is initially also instigated after all with the aspiration of refuting the psychoanalytic conceptions of dreams, indeed the notion that dreams have any meaning at all; it is therefore all the more striking that the results of this very research have since confirmed or support many of the original

psychoanalytic assumptions about dreams. On the other hand, it cannot be said that specific dream theories can be definitely confirmed or refuted by empirical results; this after all would imply a claim by one scientific tradition of superiority over another.

From a psychoanalytic perspective, an interpreting human mind (at least) is always required to reconstruct the meanings of a dream. As meaning and significance always relate to a subject, these cannot be grasped with a nomothetically orientated objectivistic research. I believe, however, that both research traditions can productively influence each other as complementary perspectives, and this has also succeeded in the clinical dream research described below: dreams or dream series from clinical practice could be investigated in their significance for psychotherapeutic processes with research methods that both interpret meaning and do justice to scientific criteria such as objectivity in terms of intersubjective replicability and reliability.

The dream in Freud

It must be understood that Freud published his *Interpretation of Dreams* (1900) during the period of a widespread consensus in European intellectual history in the wake of the Enlightenment that dreams are not meaningful, as had always been assumed in antiquity and the Middle Ages, where they were believed to constitute, for example communications from God or the gods to the dreamer; at Freud's later stage of European history they were believed to arise by chance, represent something rather like the neutral gear of the brain, and to that extent were thought to be meaningless. Against this background, Freud is to be credited not only for having rehabilitated the dream as containing a meaning but furthermore as having constructed a coherent scientific theory of how dreams arise, and what function they assume for the dreamer, and as having developed a systematic clinical methodology of how dreams can be interpreted in the context of psychotherapy.

For Freud the dream essentially carries out a dual function:

On the one hand it is ego-syntonic, since, by getting rid of the stimuli which are interfering with sleep, it serves the wish to sleep; on the other hand it allows a repressed instinctual impulse to obtain the satisfaction that is possible in these circumstances, in the form of the hallucinated fulfilment of a wish. (1933, 18)

Because repressed drive excitations that appear in sleep because they are threatening for the ego can disturb sleep, they are transformed in the course of a censorship by the dream work (condensation, displacement, symbolization, etc.) into a dream content that is no longer threatening. These mechanisms of the dream work function according to a primary-process way of working. In this sense it is true that "The dream is the guardian of sleep" (Freud 1916/17, 217). The dream is a wish-fulfilment; it tries to eliminate the sleep disturbance by a hallucinatory wish-fulfilment. For the methodology of dream interpretation, this means that, starting from the manifest dream content, the way must be found back to the latent dream content, which Freud emphasizes is only possible through the dreamer's associations (Freud 1916/17). This formulation of Freud's theory corresponds most closely to the conception put forward in the *Interpretation of Dreams* (1900).

It must be considered though that, in the course of his work, Freud repeatedly addressed the understanding of dreams and that the theory developed further (for an

overview of the theoretical developments in Freud, see Vinocur Fischbein 2011). So Binswanger and Wittmann (2019) point out that in his work *An Outline of Psycho-Analysis* (1938) Freud revises the theory of the *Interpretation of Dreams* and tries to reconcile it with the structural model he had since developed. He certainly retains the above-described elements but adds a second level of working-through by the conscious ego, in which the confused and potentially frightening contents of the latent dream thought are transferred into a plot that yields more meaning and therefore satisfies the requirements of the secondary process.

In 1900 neither the function of the guardian of sleep nor the fulfilment of unconscious wishes was still in the foreground for Freud. Over time this developed into a perspective that considers the dream as a meaningful psychic act that can be treated as a communication; moreover, the context assumed ever greater significance for the understanding of the dream narration (Vinocur Fischbein 2011). Whereas the dream work on the one hand encrypts the actual unconscious content, the dream as such, as well as specifically through the symbolization processes, provides an access for the dreamer to unconscious contents that would not otherwise be possible to reach.

At this point Freud provides the foundation for later theories that the dream can be considered as a communication about unconscious contents within the therapeutic relationship. Here the so-called daytime residue plays a role: Freud emphasizes that nocturnal dreams generally take up the events of the previous day but put them into a different context. He supposes that the day's events activate unconscious wishes and conflicts that then stand at the centre point of the dream. To that extent the dream, although it distorts the contents, brings unconscious themes to the surface. So whereas for Freud the dream was initially important for understanding the defence against unconscious drive wishes, the focus shifted in the course of development to an investigation of its significance for the transference relationship.

From the outset Freud's theory of dreams was contentious in psychoanalysis, perhaps even more contentious than any other concepts. Various early psychoanalysts, including Jung, Adler and Maeder, put forward alternative concepts (Berner et al. 2018). In contrast to Freud, Jung describes the dream as a "spontaneous self-portrayal, in symbolic form, of the actual situation in the unconscious" (Jung 1969, 263, CW 8 §505); i.e. it is not distorted by a dream censorship but, according to Jung, is exactly what it portrays. Jung amplifies the consideration at the level of the subject in whom all the figures appearing in the dream are considered as personifications of components of the dreamer's personality; this allows the dreamer's hitherto unconscious components to be made conscious. Accordingly, the dream has a compensatory function in relation to consciousness, and so offers possible solutions to conflicts or at least makes suggestions as to how the problematic situation can be considered from a broadened perspective (Jung 1954); it is therefore attributed a self-healing potential. Ermann encapsulates Jung's view in contrast to Freud's as follows: "In short, in Jung dreams reveal the unconscious; in Freud they disguise it" (2005, 44, translated quotation).

Some other early psychoanalysts, such as Adler, Maeder, Schultz-Henke and Siebenthal, also put forward a compensation theory of dreaming (Deserno 1999) in contrast to Freud's wish-fulfilment theory.

The development of psychoanalytic dream theory

Deserno (1999), Moser (2003), Bohleber (2012), Vinocur Fischbein (2011) and Jiménez (2012) give an overview of the development and the current state of psychoanalytic dream theories. The present exposition is not exhaustive but follows the above-formulated questions.

Is the dream meaningless flotsam?

At this point, the ground-breaking works by the neuroscientist and neuropsychologist Mark Solms must above all be mentioned. Based on studies with brain-damaged patients, Solms and Turnbull (2002) developed a neurodynamic model of the origination of dreams. Among other things, he was able to prove that certain regions of the brain participate in dream events, as well as to refute the hypothesis established by some neuroscientists that the dream is a meaningless neutral gear of the brain (see more detail below).

Encryption or portrayal/communication?

The most extreme counter-position to Freud has perhaps been put forward by American ego psychologists, in particular Hartmann, Kris and Erikson, who took the view that the dream in the clinical perspective is a communication like any other with no particular utility for discovering the unconscious (Berner et al. 2018). Erikson (1955) showed, for example with the famous Irma dream, that a great deal about the general functioning of the personality can be understood from the manifest dream. Another view attributes to the dream primarily a communicative function in the psychoanalytic treatment: in dreams infantile object relations are represented that also appear in the transference, but through the dream interpretation these can be made the subject of conversation; the transference dynamics are then accorded a central role also in the interpretation of the dream (Morgenthaler 1986). In this perspective, the dream takes on the meaning of a communication within the analytic relationship, for example of a commentary on the transference relationship. In parallel to this, narrative dream theories have developed (Boothe and Stojkovic 2013; Hartmann 1998).

Some theories deal with the dream under the over-arching metaphor of the theatre, which allows the various spaces, such as the stage and the auditorium, to be differentiated (Moser 2003). Dream theories of this kind are found in self-psychology, in the Kleinian school and in Benedetti. Freud had at least initially rigorously rejected this perspective: "A dream does not want to say anything to anyone. It is not a vehicle for communication" (1916/17, 231).

In her review of the development of psychoanalytic dream theories, Vinocur Fischbein summarizes that there has since been a clear tendency to regard the function of dreams less as representing an expression of unconscious wishes (Freud) than as providing a representation of the state of the (disturbed) inner world. She summarizes as follows her own view that: "dreams reported in session are communicative signs, capable of being transformed into a symbolic matrix that generates processes of psychic semiosis. They are polysemous messages with an intrinsic value not entirely dependent on the analytic dialogue" (2011, 341).

Wish-fulfilment or creative problem-solving?

In contrast to Freud, Jung describes the dream as a “spontaneous self-portrayal, in symbolic form, of the actual situation in the unconscious” (Jung 1969, 263, CW 8 §505); i.e. it is not distorted by a dream censorship but, according to Jung, is exactly what it represents. As is well-known, Jung – here too in contrast to Freud – took the view that the unconscious not only consists of what is repressed, but also contains collective components, which then assume a constructive role in the development of the personality, and especially in psychic disorders seek to move the personality towards its potential wholeness. Jung describes the relationship of the unconscious to consciousness there as compensatory (Jung 1928), by which he means the corrective attitude of the unconscious, which is orientated towards the striving for wholeness. The dream offers possible solutions to conflicts or at least makes suggestions as to how the problematic situation can be considered from a broadened perspective. In practical dream work the dream is therefore always considered in relation to the question of what its compensatory aspect is towards the current conscious mindset (Jung 1954). In Jung the dream is therefore very clearly attributed a self-healing potential. Ermann (2005) summarizes Jung’s view in contrast to that of Freud as follows:

In Freud, the dream’s function as “guardian of sleep” is at the centre, and thus the intention not to allow the repressed disturbingly into consciousness during sleep. In Jung, it is the communication from the unconscious that makes us dream the dream ... In short, in Jung dreams reveal the unconscious; in Freud they disguise it.” (2005, 44, translated quotation)

Jung’s general view could be summarized as follows: in dreams new information is made accessible to consciousness. The unconscious as a source of dreams has more comprehensive information available than consciousness and communicates this to consciousness in symbolic form through dreams. The greater the tension between the state of consciousness on the one hand and the developmental tendency of the unconscious on the other, the more strongly corrective or even critical the dream will turn out to be. Similar compensation theories of dreaming that contrasted with Freud’s wish-fulfilment theory are found among a series of other early psychoanalysts, such as Adler (1913), Schultz-Henke (1949) and Siebenthal (1953) (quoted from Deserno 1999).

Later, Morgenthaler (1986) attempted to reconceive Freud’s wish-fulfilment hypothesis: the dream influences the psychoanalytic relationship insofar as it indicates what the analyst and analysand do not initially want to know or hear, and so it provides indications for the further development of the therapy. The younger critics of the wish-fulfilment hypothesis who should be mentioned include Bollas (1987), who certainly does not completely reject this hypothesis but clearly relativizes it. Here the dream is seen no longer as a pure defence against the wish but as a possible source of insight, as demonstrated by the fact that many people have been influenced by experiences in their dreams in their real everyday actions.

A substantial change followed in the works of Bion (1962, 1967), who regarded the dream as a fundamental psychic function. Bion proceeds here from his theory of the “alpha-function”: “It seemed convenient to suppose an alpha-function to convert sense data into alpha-elements and thus provide the psyche with the material for dream thoughts ...” (1962, 182). This constitutes a hypothetical mechanism that transforms

sensory perceptions in the raw state (beta-elements) into alpha-elements, i.e. the building blocks of the psyche, which are put to use both in unconscious, symbolic thinking in the waking state and in dreams. By this mechanism, therefore, unprocessed primary experience is transformed into something with which the psyche can work, which makes thinking, memory storage and remembering and thus mental growth possible. The alpha-elements are used in dreaming to form dream thoughts.

The very interesting thought here is that dreamlike processes occur both in the waking and in the sleeping state, which is being accepted in more recent dream theories, especially from the field of consciousness research (see below). Bion thus accords the dream and unconscious thinking a creative capacity for working out conflicts, creating new ideas and bringing about psychic growth. He thereby takes a critical stance towards Freud's approach to dream interpretation in which after all the dream work has to be reversed; here Freud has recognized only the dream's defensive function and not its creative function. Insight does not occur only in the making conscious, but also in the process of the dream-thought itself. From this perspective, it is no longer a matter of interpreting unconscious wishes but generating representations and symbolizations. This endeavour goes so far as to claim that it is not that the dream is the guardian of sleep, but sleep that is the guardian of the dream, which means that the dream work is important for mental and psychic health and growth and sleep is their precondition. Similarly, Donald Meltzer observed that dreams are "a creative process which generates meaning that can be deployed to life and relationships in the outside world" (1983, 83).

Moser and von Zeppelin (1991, 1996) have developed a generative model that regards the dream as a cognitive and affective process of working through information that serves the solution of psychic problems. At the centre is affect regulation, in relation to which it should be borne in mind though that this is about not a model of interpretation but an explanatory model for the origination of dreams. The dream process entails processing traumatic and conflictual emotional experiences with the goal of problem-solving, in which between the two contexts of regulating the security principle and emotional involvement the attempt is constantly made to dream and to integrate hitherto unprocessed emotional experiences. Based on this theory, the authors have developed a coding model for investigating dreaming processes in psychotherapies (see below).

Based on his investigation of post-traumatic nightmares, Hartmann (1995, 1998) supposes an auto-therapeutic function of the dream. Freud had already grappled with the explanation of nightmares after traumatic experiences, in which the real course of the traumatic event is repeatedly exactly relived, which conflicted with his dream theory. Hartmann could now observe a process in which this is re-experienced soon in time after the traumatic event like a film and the event appears unchanged in the dream. Some time after the event, however, changes occur in the dream to the place or the persons involved; finally, real events are partly replaced by symbolic illustrations. Hartmann supposes that the dream helps in these change processes by contextualizing the emotions; i.e. in the dream, in a safe place, in which no new sensory input occurs, new connections are made, and violent emotionality is thereby calmed and integrated. Dreams process irritating experiences that accompany excited or anxiety-inducing affects, and an attempt is made in the dream to form connections with other experiences in the memory, in order thus to incorporate the painful experience along with other, less emotionally fraught memories into the memory.

The most advanced theory in this field is undoubtedly the so-called control mastery theory (Gazzillo et al. 2019) developed by the psychoanalysts of the San Francisco Psychotherapy Research Group, which includes many of the findings and concepts of empirical dream research described below:

A dream is an unconscious attempt to find a solution to an emotionally relevant concern. In dreams people think about their main concerns, particularly those concerns they have been unable to solve by conscious thought alone, and try to develop and test plans ... for dealing with them. ... From this perspective, dreams may be viewed as simple but important messages that dreamers send themselves. (2019, 3)

Dreams are therefore an adaptive resource, in that they creatively link problems and emotions with earlier memory traces and practise mastering previously unresolved situations by simulating and testing possible solutions. To that extent, a higher level of unconscious mental functioning is active in dreaming.

In summary, it can be said that in various more recent theorists a move can be observed away from Freud's wish-fulfilment theory and towards a theory that dreams predominantly carry out emotional regulation and problem-solving.

Evaluation of the manifest dream content

More recent overview studies argue that more recent theories, primarily under the influence of ego psychology, show a clear trend towards valuing the manifest dream content: "It is increasingly assumed that the manifest dream provides information about analysand's state and about his possibilities of understanding his own inner world and the inner world of others" (Moser 2003, 550, translated quotation), and that even without associative decryptions information can be directly gained in the manifest dream. In this sense, dream interpretations allow access to the dreamer's own "theory of mind", a new perspective on the dream that is emphasized especially by Fonagy et al. (2012).

The dream as a representation of the self

In Fiss's theory (1995), every dream is a formation of a foundational self; the dream is accorded the function of a consolidation of identity based on this self, a furtherance of self-development or its perpetuation or restoration. This is already very close to the perspective of Kohut (1977), who did not develop any complex dream theory but accords working with dreams a central status in analysis. In particular he adds to Freud's model of the dream a second model of so-called "self-state dreams", which occur whenever the stability of the ego structure is endangered and must be stabilized or restored. He emphasizes that this act of representing the entire intrapsychic situation in the dream is a way of encountering the endangerment of the personality structure by capturing the nameless dread in an image in the dream. Dreams are therefore a component of the psyche's self-regulating capacity that is activated when its integrity is threatened – the parallels with Jung's conception (see above) are obvious.

Stolorow (1978; Stolorow and Atwood 1993) has explained this further and emphasizes that the dream image assumes the function of encysting the threat to the personality structure by giving it a form and so it also represents a repair to the damaged or

destabilized self. It is therefore the dream's function to protect the psychic organization by the reparative use of concretization. This model leads to a way of working in analysis that no longer attempts to decode the latent dream content but focuses instead on jointly investigating the dream and how it expresses the dreamer's personal world and internal situation. It is not only the dream symbolism and the dreamer's associations that are significant here; interestingly, Stolorow also emphasizes the importance of the structure of the dream and the configurations of self and objects that structure the dream narrative. This structural relationship of self and objects in the dream contains an additional level of understanding on which the person's unconscious experiential structures are expressed. The dream is therefore seen as a mirror of the dreamer's internal subjective universe.

Fosshage (1987) encapsulates this further in his theory with reference also to neuroscientific and cognitive-psychological research and models. For him the dream's most important function is the development, preservation and restoration of the psychic organization. By creating images, the dream consolidates psychic developmental processes or actually anticipates these while these developments are still imperceptible to consciousness. Furthermore, the dream can take on the function of restoring psychic equilibrium by expressing, for example, suppressed emotions and impulses in dream images and easing their path to the dreamer's consciousness.

Long before Kohut and other self-psychologists, though, there was a similar conception of the dream in Fairbairn: based on his analytic experience he came to regard dreams as "dramatizations or 'shorts' (in the cinematographic sense) of situations existing in inner reality" (1952, 99). Accordingly, the manifest dream content does not disguise the actual meaning; instead it precisely shows the unconscious connections between the dreamer's component personalities, and between such component personalities and object representations.

The current psychoanalytic conception of dreams

This diversity of the current theoretical concepts leads Bohleber (2012), in his review of the state of psychoanalytic dream theories, to the conclusion that we must – as in the formation of theory – refer to psychoanalytic pluralism in regard to the interpretation of dreams. In his view, the mainstream has turned away from Freudian theory and made the manifest dream, as the actual dream content, the object of investigation.

Freud's theory devalued the manifest dream and obscured the fact that it has an integrative function of its own. Present-day dream interpretation in psychoanalysis has much more to do with creating meaning than discovering a latent unconscious meaning-content. This view accords the dream primarily a communicative function in the psychoanalytic treatment: in dreams, unconscious elements become accessible that can be made the object of the conversation by the dream interpretation. Bohleber also emphasizes, though, that key elements of Freud's theory have been confirmed by more recent research, first that primary-process thinking operates in dreams, and second, that unconscious motives and wishes in particular play an important role in dream production (2012, 771).

Moser (2003) try to capture the common element of all approaches in their formula:

The goal of the dream work in the analytic situation is the transfer of the dream into the shared interpretive micro-universe of analyst and analysand. The dream is a personal contribution of the reflection on one's own situation in a language of a pre-verbal kind that is not readily accessible. (555, translated quotation)

The narration of the dream then constitutes a communication in the therapeutic relationship (Thomä and Kächele 1996); fundamentally, every dream can (and must) also be considered on another level as a commentary on the analytic relationship (Ermann 2005).

Empirical dream research

It is interesting to note that empirical dream research also received its initial impetus through the stimulus of psychoanalysis, namely through Otto Pötzl in psychiatry in Vienna as early as 1917 (cf. Berner 2018). This laboratory research was continued by, among others, the psychoanalyst Leuschner (1999) in Frankfurt.

Starting from the discovery that dream-sleep can be recognized in the sleeper by rapid movements of the pupils behind the closed lids (REM sleep), this made possible an empirical access to dreams, for whenever test subjects were woken from REM sleep they consistently reported intense dreams (Aserinsky and Kleitman 1953). After an initial phase of declared opposition to psychoanalysis by empirical dream researchers, a clear shift in viewpoint has been observed since the 1970s at the latest: psychoanalytic concepts are increasingly being taken seriously and no longer rejected out of hand as unscientific, and even in the 1960s empirical dream researchers were adopting psychoanalytic concepts in their own theories and testing these systematically (e.g. Hall and Van De Castle 1966). In more recent overview studies on dream research there is actually no longer any lack of appreciative references to contributions made by psychoanalysis to the explanation of the dream (cf. e.g. Schredl 2007).

REM sleep is important for the organism

Hartmann (1973) established in his systematic studies that REM sleep deprivation resulted in irritability, difficulties in concentration, and problems in interpersonal contact and impulse control. It is also the case that after a few days of deprivation the organism compensates for the lost REM sleep (REM rebound), indicating that the organism has a biological need for dream-sleep. This premise is also supported by the fact that REM sleep puts a strain on the organism and therefore consumes a great deal of energy. It would be biologically meaningless to compensate for such an exhausting activity if it were not important for the organism's functioning.

Continuity between the waking state and dreaming

The activation-synthesis theory of Hobson and McCarley (1971, 1977), according to which dreams originate from meaningless random activations of the brain, has since been considered as disproven in empirical sleep and dream research. This was attested to primarily by Solms (1997, 2000) in studying the dreams of brain-damaged individuals. He was able to show that, according to which regions of the brain were damaged, dream activity and REM sleep occur independently of each other, and therefore that dreams are produced in various centres (for an overview of the debate between Hobson and Solms, see Solms 2013). By this clinical-anatomical demonstration – based partly on Freud's aphasia research – Solms (2011) was able to disprove the above hypothesis that dreaming is

the brain's attempt to make sense of meaningless excitational storms from the brain stem – and so to that extent to prove that dreams are not meaningless.

Today it is generally supposed that mental activity continues in sleep and experiences from waking life continue to be processed here, but that the regions of the brain participating in this are different from those acting in the waking state. “Earlier claims that dream contents arise purely randomly and have no connection with the dreamer’s world of waking experience are no longer tenable today”, states one of the leading German-language dream researchers (Schredl 2006, 50, translated quotation). Instead, a general continuity between mental activity in waking life and in dream-sleep is assumed, and this theory of continuity is regarded as well attested (Hobson and Schredl 2011; Schredl 2015). This means that a person’s form of mental functioning is not fundamentally different in dreams from in the waking state (cf. here Bion).

Specifically, this also means that people with psychic disorders portray these psychic characteristics in parallel in their dreams; for example, depressive patients have “masochistic” themes in their dreams significantly more often than healthy test subjects do. A close quantitative connection can even be ascertained: in depressive patients, the severity of their depressive symptoms correlates directly with the intensity of negative emotion in the dream, and changes in parallel with the improvement of the emotional state in the context of a therapy (Schredl 2015, 31). The current President of the International Association for the Study of Dreams, Deirdre Barrett, summarizes this as follows: “I believe that dreams are just thinking in a very different biochemical and electrophysiological state” (2015, 91).

Meaningful connections between waking life and dream content

Kramer et al. used a classification procedure to investigate whether dreams are meaningful. They obtained the clear result “that dreams are, as depth psychologists have assumed, orderly non-random events and that they reflect day-to-day changes in the life of an individual” (1976, 780). In their most recent overview study on dream research, Kramer and Hoffmann (1993) summarize the current position of empirical dream research to the effect that the dream report reflects the dreamer’s psychology, and indeed in relation to both current states and personality traits. In their large-scale overview studies on the empirical testing of Freud’s theory, Fisher and Greenberg (1977, 1996) present a wealth of empirical studies that attest a connection between a person’s waking life and dream activity, for example:

- People who have experienced natural disasters more frequently have nightmares.
- Pregnant women dream significantly more often about babies than non-pregnant women.
- There are many parallels between the results of projective tests and the manifest dream contents.

Schredl (2006) gives a similar summary of experimental dream research. Accordingly, people who played a role in waking life the previous day appear significantly more often in dreams than other events in the more distant past. In particular, events in waking life that represented a real stress for those concerned (i.e. were not

experimentally induced) often appeared as dream contents; these can include forthcoming operations, a separation or an abduction. Altogether, emotional participation increases the probability of dreaming about a waking event, such as the refusal of food in the dreams of individuals with anorexia. Generally, the dream therefore reflects events in waking life, especially when they are emotionally significant for the person. Conversely, dreams have an effect on waking life, in particular on the mood the following day (Schredl 2000).

Dreaming and creativity

There are countless well-supported examples of the furtherance of creativity by dreams. Many artists, including Salvador Dalí, Ingmar Bergmann, Carlos Saura and Federico Fellini, are known to have transposed dreams in their art. Paul McCartney heard the melody of the Beatles song “Yesterday” in a dream and was initially surprised to find that it was not already a known melody. In the sciences, the structure of the periodic table, the invention of the sewing-machine and the deciphering of Babylonian cuneiform script were also stimulated by dreams (Schredl 2006).

In addition to these individual case reports, there are also systematic empirical studies on the contribution of dreams to creativity; creativity here means receiving an idea in a dream that has an impact on waking life, such as a change in the dreamer’s own behaviour. Kuiken and Sikora (1993) and Schredl (2000) report that in student samples, 20–28% of participants revealed that they received creative impetus from dreams at least twice a year. The dream researcher Deirdre Barrett (2001), far from being an adherent of psychoanalytic dream theories, presented a comprehensive collection of stories and experience-based reports of dream-based creative solutions to problems in science and culture. Moreover, Barrett (2015) carried out systematic laboratory studies on the conditions under which problems in waking life are creatively worked out in dreams. These conditions can be specified.

The function of dreaming

There are several theories by empirical dream researchers, who ascribe to dreaming an adaptive function for the psyche (Moffitt, Kramer, and Hoffmann 1993). In their “mastery hypothesis”, Wright and Koulack (1987) suggest that cognitive activity in dreaming is of the same kind as in waking life and that solutions to problems are sought in dreams. As it can be shown that the morning mood varies less than the evening mood, the theory of mood-regulation (Kramer and Hoffmann 1993) attests that dreaming processes emotional experiences and balances the mood. Hartmann’s theory (1996) supposes that dreaming allows another form of information processing: as divergent thinking with wider-ranging associations prevails in REM sleep, creative solutions are more easily found here than in the task-orientated convergent thinking of the waking state. The fact that in REM sleep a mode of wider-ranging associations prevails was experimentally confirmed by Spitzer, Walder, and Clarenbach (1993). In his studies on the processing of traumas in dreams, Hartmann (1998) was able to prove an auto-therapeutic function in dreaming. The work of dreams consists in incorporating unmastered affects into a context of experiential knowledge so that post-traumatic affects can be attenuated.

Consolidation of memory

Empirical studies indicate that REM sleep in particular is essential for the formation and stabilization of memory contents and so is a direct precondition for the functioning of consciousness (Hallschmid and Born 2006). A famous study by Crick and Mitchison (1983) also formulated the theory that the dream is primarily important for forgetting irrelevant information and so has a decisive importance for the functional capacity of consciousness.

Emotional regulation

As mentioned, dreams, at least in the morning, still have a clearly perceptible mood-balancing effect; they obviously regulate affects and emotions. Rüter and Gruber-Rüter (2000) try to put the affect-processing in dreams into a theoretical framework. They proceed from the fact that during REM sleep there is a complete halt to the inhibiting influence of serotonergic connections on the frontal cortex, weakening its central and ordering control. This brings about an associative loosening of the brain functions, which allows existing affective patterns to be activated and new patterns to be playfully tested out by the high exchangeability of individual affects.

Cartwright et al. (1998) were able to show that sleep has an affect-stabilizing effect: in healthy test subjects with a higher evening depression score, negative affects predominated in the first half of the night, whereas the second half of the night was more influenced by positive affects. Affect-charged dream sleep therefore has a healthy effect on milder deteriorations of mood. This could be explained by a mechanism similar to the above affect hypothesis, according to which negative affect can be processed in the dream by the testing of new positive affective patterns that are reinforced where successful. The most recent studies point in the same direction, showing that even nightmares have a positive effect on coping strategies in the waking state (Picchioni and Hicks 2009). Cartwright (1991, 2005) also summarizes her long-term studies by stating that dreams definitely have a stress-reducing, emotion-regulating and mastery-furthering function. In an overview study, Nielsen and Lara-Carrasco state:

In sum, evidence from a variety of types of studies supports the notion of an emotion regulation function of dreaming and the more specific suggestion that dream characters and their emotion-laden interactions with the dream self may mediate this regulatory effect. (2007, 274)

Nielsen and Levin (2007) even suppose that dreaming has an anxiety-eliminating function. In dreams there is an increased accessibility to fearful memories that are then normally reorganized in the dream and not combined with anxiety-inducing qualities. In nightmares this function fails.

Furtherance of insight

The specific question of whether (dream-)sleep fosters insights was examined by Wagner et al. (2004). In their experiment, test subjects had to carry out a so-called number-reduction task that required them to identify a hidden rule. It turned out that in the experimental group that was allowed to sleep in the meantime, over twice as many test subjects had gained insight into the hidden rule than the control groups. Here it was

proven that the improved capacity for insight did not result from the brain, as it were, having continued the task in sleep, but through a combinatory work having obviously at least been prepared in sleep. This would be evidence that in dreams greater and also unconscious areas of the psyche can work together in coordination and therefore that a greater processing capacity is available than in waking consciousness, which allows more creative insights (as Jung supposes); it is provable that in dreams more brain systems are simultaneously active than in the waking state (Edwards et al. 2013).

Problem-solving

A connection could also be established between the amount of REM sleep and the capacity to solve new or difficult tasks (Fiss 1979). REM sleep consolidates important cognitive functions such as learning, problem-solving, memory and coping mechanisms.

Summary: a contemporary theory of the function of dreaming

It can therefore be stated that all the more recent empirically based dream theories regard the dream as an information-processing activity that operates not meaninglessly but by certain rules. Dreams are not only connected with the experiences and problems posed in waking life; they also process them in a goal-directed and manifestly beneficial way. The dream researcher Calvin Hall summarizes this insight succinctly: "Dreaming is essentially a creative process, ... the product of good hard thought" (1966, 57).

The connection between dreaming, memory and problem-solving can be formulated from today's perspective approximately as follows (cf. Windt 2015): daytime experiences, especially those with emotional significance or really oppressive affects are reactivated from the short-term memory store during dreaming and calibrated with earlier experiences from the long-term memory, more particularly in the same way as similar experiences and conflicts in earlier situations were solved or overcome. To that extent a problem-reworking and to some extent also problem-solving actually takes place during dreaming, so that the reworked contents can be stored in the long-term memory and cease to burden mental functioning in everyday life. If this does not succeed, the dream may lead to waking up, or it may be experienced as a nightmare or at least remembered. This reworking of memory contents in the dream is therefore a highly structured, rule-governed and goal-directed reworking process that operates largely unconsciously, extensively coordinates various domains of mental functioning, but can also only take place while there is no new mental input of the kind that occurs in the waking state (cf. also Vedfelt 2017).

The fact that these processes are important for the organism, and dreaming is to that extent functional, is also demonstrated by REM sleep deprivation: there is then an increased aggressive and sexual activation, reduced adaptive capacity, concentration disturbances, memory impairment, learning difficulties, a lesser capacity to deal with stress, and lower psychic stability. If dreams are more intensively reworked, this leads to an improvement in the mental state. Conversely the number of threatening or aggressive dream contents increases if the person was previously subjected to threatening events in the waking state. In summary, it can therefore be stated that dreaming assumes a regulating function for the organism and in particular for mental functioning.

The empirical investigation of the content of dreaming

Hall and Van De Castle (1966) developed a systematic scientific method to investigate the content aspect of dreams. A classification system provides categories for scenes, people appearing, actions and emotions in the dream, such as how often men appear as opposed to women, aggressive or sexual acts and so on. In addition the “contingency analysis” method was developed (Hall and Van De Castle 1966), which can explain recurring connections between the elements of a person’s dreams.

Hall and his colleagues used this classification system in long-term studies to examine the dream series of very different test subjects over several years. They were able to show that the people, objects, actions and themes appearing in the dreams remained the same over a long timespan. The contents of a person’s dreams also show a high consistency over long periods of time. This can initially be better explained with Jung’s dream theory than with Freud’s, as Jung supposes that the dream seeks to compensate consciousness, and to that extent it would seem probable that since after all the underlying conflicts and complexes do not change, these are also repeatedly thematized.

Dream-based personality diagnostics

With Hall’s investigative approach it could be proved with scientific accuracy that dreams are not random products, but that their contents are systematically connected with the dreamer’s personality and waking life, and that it is even possible to derive from the analysis of the content of the dreams a valid personality diagnosis of the person. The dreamer’s central life themes and problems can be determined from the dreams alone (Hall and Van De Castle 1966). In many cases Hall was able to show, with the aid of the objective classification of the dreams alone, a clear connection between the themes of the dreams and the personality, as well as the person’s psychic life, without any recourse to a dream interpretation theory. This clearly contradicts Freud’s theory that assumes a distortion of the dream contents by the dream work. Among other things as a consequence of these insights, the above-described shift towards an emphasis on the importance of the manifest dream content has taken place in psychoanalytic dream theories.

Children evidently dream more often about animals than adults do (Hall 1966). With the child’s increasing age, the frequency of animal dreams continually reduces. It is extremely interesting that in children over seven years old who still dream about animals more often than average, lower social skills can be ascertained than are the average for their age group. Children also dream about frightening animals more often than adults do (28% versus 7%), with the animals appearing increasingly well tamed and controllable with the child’s increasing age. These insights can be well explained with psychoanalytic dream theories: especially in children who do not yet have so much control over their psychic functions and cannot reflect in the same way as adults, threatening animals in dreams could symbolize the still uncontrollable impulses and affects that could be experienced by the (dream-)ego as a threat to its autonomy. The connection between lower social skills and more frequent animal dreams would confirm this.

The fact that the dream ego’s actions in the dream represent a mirror of ego strength and the capacity for reflection and control is also proven by the investigations of David

Foulkes (1999), who showed that it takes up to thirteen years for the human capacity for dreaming, in parallel with cognitive and emotional development, to become fully developed. Children, he states, have only short, emotionally neutral dreams, without complicated actions. In these dreams no dream ego generally appears; this only arises in dreams at the age of around seven years old.

Barrett (1996) was able to demonstrate in people with multiple personality disorder that diagnostically known split-off component personalities of these patients appeared in their dreams as people who sometimes even gave the dream ego helpful advice for waking life. She interprets this as evidence for the correctness of Jung's view that personality components appear as people in the dream. She was able to confirm this insight in a series of further studies for healthy test subjects as well, observing that: "Dreaming is the only state in which most of us interact with aspects of ourselves as discrete other people" (Barrett 2015, 86).

More recent overview studies support the insight that the contents of dreams are systematically connected with the dreamer's personality and his significant psychic themes (Perogamvros et al. 2013; Windt 2015).

Patterns in the dreams of one night

Schredl (2006) was able to prove that dreams at the beginning of the night are likelier to take up day residues in the sense that they refer to events of the previous day, whereas dreams from the later phases of the night relate to events in the more distant past. Kramer (1964) was able to demonstrate a pattern here: in the first half of the night dreams deal with current experiences; in the second half they are more likely to be concerned with events from the dreamer's past; and towards morning they return to current themes. The move from current to past events over the course of the night would at least confirm Freud's view of the connection between day residue and biographically determined unconscious conflicts.

Cartwright (1977) was also able to show that morning dreams manifest a problem-solving tendency. The first dreams of the night take up a current topic and problematize it; subsequent dreams refer back to the dreamer's past in order to seek possible solutions to problems there, and the final dreams before waking then contain attempts to solve the problem. In a more recent review of the relevant research, Horton and Malinowski (2015) state that dreams organize memories into narratives in which episodic memories from the most recent period are calibrated with older memory contents.

As an interim result, it can be recorded that dreams have a psychological significance and take up emotionally relevant themes; to that extent, empirical research confirms the psychoanalytic approach to the dream. In this way dreams work out the problems of waking life in a task-orientated way and to that extent serve psychic self-regulation, fostering insight and creative solutions to problems. This is possible because dreams can produce wider-ranging associative connections than thought in the waking state. In dreams the brain can switch into a processing mode in which it no longer continually has to process new input, resulting in greater capacities being left free to deal with unsolved problems and to work them out creatively (Barrett 2001).

Empirical studies concerning therapeutic work with dreams – clinical dream research

Independently of empirical dream research, there were already some very early empirical investigations on dreams and their significance for psychotherapy in psychoanalysis itself. The extensive investigation of dreaming begins with Freud's detailed analysis of the Irma dream, where he uses a specific example of a dream to prove "the possibilities and imponderabilities of such an endeavour" (Fischmann and Leuzinger-Bohleber 2018, 834, translated quotation), which can be regarded as the starting point of a new line of research. This interpretive approach was, however, also criticized very early in psychoanalytic research by psychoanalysts themselves:

It certainly seems to me that a considerable and not unfounded part of the doubt about dream analysis as science derives from the fact that it almost invariably begins with an interpretation of content that allows great subjective scope with relatively limited possibilities of objective verification. (Bash 1988/1950, 145, translated quotation)

Empirical studies in psychoanalysis began with Alexander (1925), who was also the first to take a systematic look at series of dreams. Further early studies originate from French (1954).

In a study by Fiss (1979), two groups of test subjects were formed. The first group were woken in all the phases of REM sleep and had to report their dreams, in order to discuss them the next morning with the leader of the experiment. The second group was woken during non-REM sleep phases. In parallel with the sleep laboratory sessions both groups received the same number of therapeutic conversations. The test subjects who remembered their dreams the next morning and could then discuss them with the leader of the experiment made evidently greater progress in the accompanying therapy, as measured by standardized tests and independent clinical evaluation.

Comparable results were obtained by Clara Hill's research group (Hill 1996; Hill and Spangler 2007). Hill was a more cognitive-humanistically orientated researcher who developed and examined her own method of therapeutic dream work that clearly has strong connections with Jung's procedure. Here too it was found in a series of studies that test subjects whose dreams were incorporated into the psychotherapy and were worked out there benefited significantly more from the therapy than a comparison group.

Greenberg and Pearlman (1978) woke test subjects undergoing psychoanalytic treatment in the sleep laboratory after REM phases and compared the content of their remembered dreams with verbatim minutes from the previous and the subsequent therapy session. It turned out that there was a clear correspondence between the dream contents and elements in the analytic session that were emotionally significant for the test subject. The authors go so far beyond Freud in the interpretation of their results as to say that it is enough to know the conflictual themes in the dreamer's waking life to translate the content of their dreams unproblematically – the quest for an encoded latent meaning content becomes superfluous. Palombo (1982) was also able to show that in dreams analysands reworked contents from the directly preceding analytic session that could be recognized as such without decoding.

Popp, Luborsky, and Crits-Christoph (1990) compared dream reports and reports in the therapy session with an interpretive research methodology known as the core conflictual

relationship theme. Here not only similarities of content, but also even correspondences in the unconscious underlying relational conflict patterns were ascertained. Interestingly, there is even a study in which the information content of the first dream presented in an analytic therapy was examined for the central themes of the patient and the therapy (Bradlow and Bender 1997). It could actually be shown that this “initial dream” reflects themes of key importance for the later therapy (also Kramer 2015).

Extensive empirical studies have also been carried out by the psychoanalysts Kramer and Glucksman (2015). First, they were able to show that the content of dreams is influenced by the dreamer’s sex, age and socio-economic level, as well as by psychic disorders, especially depression and schizophrenia. Changes also appeared in the content of the dreams to the extent that patients were able to improve clinically in the therapy. In these studies too a very clear connection could be made between the dreamer’s emotionally significant experiences and the themes that arose in the dreams. In sleep laboratory studies, they were also able to show that, in the dreams of a single night, one prominent emotional theme was repeatedly reworked and that this dream content did not fundamentally change even over twenty nights. They explicitly summarize it thus: the emotional intensity of the experience before sleeping determines its effect on the dream. This effect is so strong that independent evaluators can identify the person’s immediate and long-term significant themes from dreams alone.

More recent psychoanalytic research papers on dreams generally examine connected dream series over the course of the psychotherapy (Fischmann and Leuzinger-Bohleber 2018). French (1954) had already indicated that the logical structures of various dreams in the same person are interconnected so that all these dreams are components of a single communication structure. He was able to prove that in the dream series the affective range is narrower at the beginning and gradually increases over the course of the therapy. Deserno and Kächele (2013) also mention among the early studies on dream series a study by Alexander Mitscherlich in 1947 (Mitscherlich 1989), in which he investigated already complete dream series. Fonagy et al. (2012) give a present-day overview of psychoanalytic clinical dream research.

However, in this type of clinical research too there is a danger of circular arguments in which what is repeatedly “confirmed” is only what was previously known, to which Fischmann and Leuzinger-Bohleber (2018) refer. It is also worth bearing in mind that a distinction has to be made between the dreamed, the remembered and the reported dream (cf. Moser and von Zeppelin 1996), which is why nowadays even the report of a dream always also has to be regarded as a communication within the transference relationship. It is necessary therefore to work from the premise that the narrated dream is a product of a process that is still developing, but that it is, however, still possible to assume a structural identity between the dreamed, the remembered and the reported dream. Therefore the dream is considered as a narrative in more recent theories.

In 1968 a formal affect and connection analysis was conducted for the first time in the dream series of patients with psychosomatic disorders, for which psychotherapeutic sessions were tape-recorded for the first time. This research on systematic dream-corpora was then continued at the University of Ulm. A series of prominent investigations within German-speaking psychoanalytic dream research is based on records of psychoanalytic treatments in the context of the Ulm Textbank (overview in Fischmann and Leuzinger-Bohleber 2018).

Leuzinger-Bohleber (1989) examined 112 dreams from five long-term psychoanalytic therapies, consisting in each case of dreams from the first and last 100 sessions, based on the coding system used by Moser and von Zeppelin (1996). She ascertained that, in positive treatment courses, the dreams at the end of the therapy differed from those at the beginning, which was not the case in unsuccessful therapy. In successful therapy the spectrum of affects in the manifest dream contents expanded and anxiety dreams were less frequent than at the beginning of the treatment. There were more successful than unsuccessful solutions to problems and the dream ego was more active and less frequently in the observer position. Also, as in Hall and Van De Castle (1966), there were fewer animal representations and more human beings and more mature object relationships. The relationship quality changed, becoming friendlier and more caring, negative emotions about the self in the dream lessened and the capacity for successful problem-solving increased.

Corresponding changes were also found in the current LAC (long-term chronic) depression studies (Fischmann, Leuzinger-Bohleber, and Kächele 2012, 171). These consist above all else of a more active attitude of the dream ego, which is evidently no longer passively overwhelmed by intolerable affects, as well as better relational patterns of the subject in the dream. In particular, the subject in the dream no longer takes a distanced observer position but is actively involved in the dream events and striving to solve problems. With reference to the studies by Weinstein and Ellmann, Leuzinger-Bohleber formulates based on these results the following hypothesis:

The dream ego is simultaneously pleasure-seeking and object-seeking and tries out solutions to problems for current events in connection with central conflictual complexes. Therefore the problem-solutions in the dream contain references to turning-points in the psychoanalytic treatment and therapeutic changes. (2013, 267, translated quotation)

Döll-Hentschker (2008) also used the coding model of Moser and von Zeppelin (1996) to examine 142 dreams from five psychoanalyses and obtained very similar results: intra-individual differences between the beginning and end of treatment when there was a positive course of treatment, as opposed to minor or negative changes where the treatment took an unsuccessful course. Similar results were also found by Kächele in various studies (see the overview in Kächele, Eberhardt, and Leuzinger-Bohleber 1999).

In a video-recorded psychoanalytic treatment from the Ulm Textbank, Amalie X, the best-investigated individual case in the history of psychotherapy research, ninety-three dream reports were identified and examined from various perspectives (Boothe 2006; Boothe 2018; Kächele 2012; Merkle 1987). The results showed that the percentage of successful problem-solving strategies increased in the dreams at the end of the therapy, whereas the unsuccessful strategies reduced. The emotional atmosphere in the dreams also changed at the end of the treatment, as negative emotions about the dream ego itself reduced.

Similar results were obtained by studies with the method of structural dream analysis (Roesler 2018); first, that there are clear connections between typical dream patterns (e.g. the dream ego is threatened and flees) and the dreamer's pathology – the connections between the dream ego and threatening figures and the dream ego's reactions to this threat represents an image of the relationship between the person's ego strength and

unintegrated or conflictual motivations and complexes. Second, it was found that these dream patterns systematically change in successful therapies to more successful actions by the dream ego. Kächele, Eberhardt, and Leuzinger-Bohleber (1999) conclude that changes during the treatment are clearly reflected in the change in the structure of the dreams. Deserno and Kächele (2013) summarize these insights in their hypothesis that the organization of the individual dream depends in each instance on the solutions that were found in the preceding dreams.

Conclusion: what do these insights mean for psychoanalytic dream theory?

Fundamentally, it must first be noted that although the above-portrayed findings of dream research may be interesting and helpful in many respects for the development of psychoanalytic theory, there are also some very fundamental differences in perspective. So, for example, empirical dream research is far from being the kind of model that is assumed in psychoanalysis, according to which the dream primarily serves the reworking of unconscious contents in psychodynamic terms; when reference is made in dream research to insight, that means instead a cognitive problem-solving and thus something completely different from psychoanalysis. But on the other hand, in many psychoanalytic dream theorists a certain resistance must be detected towards recognizing the insights of dream research, whether clinical or non-clinical, and in consequence revising or even giving up their own favoured theories. This problem is also referred to by psychoanalytic authors:

The pitfalls of psychoanalytic clinical research are well-known. They range from the random selection and summary of clinical material to prove certain theoretical perspectives, to hermetically enclosed lines of argument, apparently narcissistic considerations instead of self-critical, open-minded reflections on clinical observations to the presentation of psychoanalytic “star cases” instead of normal or even failed treatments. There is also ... the danger of an (unconscious) construction of desired psychoanalytic insights that correspond to the prevailing theoretical concepts and thereby repeatedly confirm these. (Fischmann and Leuzinger-Bohleber 2018, 638f., translated quotation)

In my view, some of the questions raised at the outset can also now in fact, precisely on the basis of the results of dream research, be answered to a very large extent. They provide confirmation of some of the premises of psychoanalysis – sometimes very impressively – but classical psychoanalytic standpoints must also at least be reassessed if not actually abandoned.

Dreams are meaningful

An initial key insight gained from the comparison of dream research and psychoanalysis can be noted, however, namely, that it is very impressively proven that dreams are fundamentally meaningful and are not a meaningless neutral gear of the brain. Many studies attest the close connection not only between dreaming and the dreamer’s waking life, but also with emotionally significant and burdensome themes and the dreamer’s inner conflicts. This impressively confirms the basic premises of all psychoanalytic schools, but in particular Freud’s pioneering work.

What does the dream take up?

The day's experiences, especially ones with emotional significance or really burdensome affects, are reactivated during dreaming from the short-term memory store and calibrated with earlier experiences from the long-term memory, in particular in terms of how similar experiences and conflicts in earlier situations were resolved or overcome. This would first confirm Freud's fundamental premise that dreams link current events (day residue) with earlier experiences and, indeed, especially those that are emotionally burdensome. Freud may, however, have at this point underestimated the problem-solving orientation and mastery-work of the dream; current psychoanalytic dream theories (e.g. self-psychology, Fosshage, but also already Jung) emphasize at least to some extent this creative problem-solving potential.

Self-portrayal or decoding?

There is no evidence that any decoding or distorting activity takes place in dream sleep (the continuity conception of the waking and dream state of current experimental dream research; Schredl 2006). Bodily stimuli that occur in sleep are worked into the dream, but rather than being distorted are expressed in a visually similar way.

In a series of empirical studies, the Freudian psychoanalysts Glucksman and Kramer (2015) have explicitly examined the question of whether the manifest content of dreaming is enough to understand the dreamer's psychodynamics and to describe changes in the patient's symptoms in the context of a psychotherapy. As results of their systematic studies they state that: the manifest content of dreams changes in parallel with the clinical change during psychotherapeutic treatments, especially when the structure of the dream narrative is examined; likewise, the affects that are represented in the dream act in parallel with the change of the affects in the course of the treatment; also from the first dream (initial dream) of a treatment a valid prediction can be made not only about crucial themes in the course of the therapy, but also about the outcome and the improvement achieved; and finally, from the dreams alone a correct formulation of the patient's psychodynamics can be made that accords with the evaluation of the treating therapist as well as with the themes that are worked on during the therapy. In conclusion, they state that, within psychoanalysis, the meaning of the manifest dream content must be fundamentally reconsidered.

Fisher and Greenberg (1977, 1996) also state, although striving more to find proof of Freud's theories in empirical studies, that, with regard to the overwhelming data situation, the meaning of the dream lies more in the manifest content, and is not encoded or distorted.

Self-portrayal rather than disguise

Many more recent psychoanalytic theories refer directly to the dream's self-portraying function, for example Kohut (1977), Stolorow (1978), Fosshage (1987), Fiss (1995), and very early also Fairbairn (1952) and Jung (1969). Most of these authors further attribute self-regulating capacities to the dream, in particular Hartmann (1995, 1998) in his works on nightmares. In line with experimental dream research and its continuity hypothesis,

it is the day residue that is given the actual importance today in psychoanalytic dream interpretation, rather than the reductionist quest for the hidden infantile wish. Starting from the day residue, connections with the past, the present and the current therapeutic situation are worked out through associations with the dreamer. Instead of the fulfilment of infantile drive wishes in the dream, today self-portrayal and an attempt at solving problems are instead seen (Kohut 1979; Moser and von Zeppelin 1991). In Kohutian self-psychology (1979) it is assumed in accordance with Jung's view that the psyche has a self-regulating capacity. The dream's function is then seen as to stabilize or restore the psychic organization under threats to the integrity of the self, while in the dream the intrapsychic situation is represented, almost pictorially concretized.

Based on current insights from empirical dream research referenced also here, as well as the neurosciences, Fosshage (1987, 1997) has formulated a modern psychoanalytic theory of the dream. Accordingly, the most important functions of dreaming are the development, preservation and reintegration of the psychic organization. The dream can effectively regulate emotions, develop solutions to problems for current conflict situations and restore equilibrium to the psychic structure. Through its imaginings, the dream can give an image of psychic developmental processes that are still inaccessible to consciousness. Fosshage points out that his conception of the dream's self-regulating and problem-solving function accords with Jung's concept of the compensatory function.

“Guardian of sleep” or creative problem-solver?

Certainly, some psychoanalytic researchers argue on the basis of their own empirical studies that Freud's premise of the dream's protective function for sleep is empirically provable (Ermann 1995; Solms 1997). But a review of the results of dream research on this question shows that this in fact represents an isolated position. The overwhelming majority of dream researchers as well as psychoanalytic authors (e.g. Werner and Langenmayr 2005) interpret the empirical findings as a refutation of Freud's view. The dream is definitely not the guardian of sleep; it is the opposite way round: we need REM sleep because if we are deprived of it the organism compensates for this in the following nights to an increased degree (Schredl 2006) and, to that extent, sleep is the guardian of the dream. Accordingly, the psychoanalyst Berner also summarizes the results in his review of empirical dream research: “The protection of sleep turns out not to be the function of what are almost continual dreams” (Berner 2018, 113, translated quotation).

The account of empirical dream research had after all demonstrated that dreaming generally assumes a regulatory function for the organism. The question now is how this regulation can be understood psychoanalytically, as it were locally, i.e. during sleep by the transformation of threatening contents in the sense of dream censorship, in order to protect sleep, as Freud thinks? Actually, in the dream itself there is a reworking and attenuation of difficult affects. Altogether, however, it can still very clearly be shown from dream research that dreams contain a strong problem-solving activity that can effectively work out psychic tensions and conflicts of the person's waking life and so not only carry out a work of psychic regulation, but also advance the development of the personality towards a stronger integration. This clearly supports contemporary psychoanalytic dream theories, for example in self-psychology, or Jung's self-regulation theory, whereas Freud had obviously underestimated this problem-solving capacity of dreaming.

The constructive contribution of dreaming, however, also plays a role in Freud's theory, to the extent that the dream takes up unconscious conflicts, thematizes them and so creates a potential for them to be made conscious.

Wish-fulfilment theory

According to Fischmann and Leuschner (2008) the wish-fulfilment theory cannot be experimentally proven (see also next section). They certainly report some limited research evidence for the wish-fulfilment theory, but there are very many more results that clearly contradict it, as after all Freud himself had to admit in relation to post-traumatic dreams. From the outset there were also many critics of the wish-fulfilment theory even within psychoanalysis (see the overview in Boothe 2018): if desired, it was always possible to interpret dreams so that a wish-fulfilment emerged at the end – this being an immunization strategy of psychoanalysis. Certainly, the account of empirical dream research shows that the dream can definitely be accorded regulating functions, although it remains unclear exactly what is being regulated there. In the wake of the insights of empirical dream research, a series of additional functions has therefore since been attributed to the dream in psychoanalysis in addition to wish-fulfilment, including memory consolidation, problem-solving, stress reduction, creativity, conflict resolution and affect regulation (Kächele, Eberhardt, and Leuzinger-Bohleber 1999).

Does the dream compensate?

The continuity theory of waking and dream life as a conclusion of experimental dream research is rather a counter-argument to the compensation theory. Vedfelt argues that the "opposite-continuity debate [i.e. compensation vs. continuity] measured against the actual complexity of the dream phenomenon is simplistic" and also that "the differing creativity of professional dream-interpreters ... plays a role in this, which is then construed in the interpretation as contrasting with waking consciousness and waking life" (1997, 278, translated quotation).

Generally from my perspective, what fundamentally applies for both theories – wish-fulfilment and compensation – is the following epistemological impediment: psychoanalytic dream interpretation is a form of hermeneutics and thus always operates in the sphere of subjective, at best interpersonal meaning attributions and meaning structures, and is thus categorically different from the realm of objective data. It therefore has to be fundamentally asked whether the two theories are accessible to testing in the nomothetic research paradigm at all. Even the question of what the dreamer's current problem situation is to which a dream element could then exist in a compensatory relation is largely a result of an interpretation of subjective meaningful connections (the same symptoms can represent a painful problematic for one person, but not at all for another). The same applies for the wish-fulfilment theory: the question of what is the latent, unconscious (drive-) wish that is represented in disguised form in the dream and also satisfied, is the result of an interpretation/reconstruction in the context of the analytic relationship, and is therefore an intersubjective meaning attribution.

At this point the distinction between clinical praxis, which after all ultimately seeks to change the patient's subjective experience, and scientific research, which is geared

towards the formulation of general laws and connections, is of key importance. For clinical praxis it makes complete sense to apply a theory such as wish-fulfilment or compensation as an interpretive strategy in order to use the dream in a therapeutic sense and so open up to the patient new perspectives on themselves. Accordingly, psychoanalysis has after all always emphasized that the criterion of the “correctness” of an interpretation is ultimately always the patient’s reaction – which does not mean conscious agreement but the response of a meaning-creating subject. It follows from this that a somehow different verification of the compensation theory as well as the wish-fulfilment theory still presupposes interpretational procedures.

A compromise formula: expansion of consciousness

Based on the reported research findings and the consensus of views among dream researchers, I therefore want at this point to suggest a reformulation of both theories. The research findings can be summarized with Werner and Langenmayr – also confirming Freud’s basic premises – as follows:

The many investigative results can best be reduced to the following common denominator: the dream serves the reworking of emotional experiences, their integration into earlier experiential contexts and the consolidation of memory... In this context it can also assume the function of the hallucinatory satisfaction of wishes. The integration into previous experiential contexts calls on current, recent and very much earlier experiences dating back to childhood. The reworking in the dream of what was previously experienced thereby seems to extend from current to earlier connections. The material used in the dream is unconscious to differing intensities ... (2005, 169/70, translated quotation)

By incorporating the insights that the mental processes in the dream can obviously refer back to wider-ranging connections and networks between regions of the brain from those of the waking state, it could be formulated that the dream uses more extensive mental functions, memories and knowledge than the waking state and so can extend or amplify the possibly limited perspective of consciousness by additional information, and is thereby actually creative and orientated towards problem-solving. But this amplification does not necessarily exist in an opposite relation to consciousness; rather, consciousness is expanded with the aid of the dream by new information. The theory that this new information in the dream proves to be increasingly critical or corrective, the more one-sided consciousness is in regard to its problems is not confirmed.

Final acknowledgements

In their major overview study on the significance of empirical findings for Freud’s dream theory, Werner and Langenmayr show that the most important insight is that Freud’s fundamental premise that the dream has a psychological meaning and is closely connected with the dreamer’s life is extensively empirically validated. They emphasize, though, that the significance of the manifest dream is firmly reinforced by the empirical literature, and that the importance of the dreamer’s associations for elucidating its meaning must be reassessed: “For the dreamer as a person, essential factors can also be inferred from the manifest dream. It is not plausible to suppose a fundamental difference between

the dream and the waking state" (2005, 170, translated quotation). In addition, they quote a series of insights that put in question Freud's premise about the dream's function of protecting sleep. They also emphasize that more recent research insights show a great similarity between dream sleep and the function of waking consciousness, which is difficult to reconcile with Freud's view. The psychoanalytic dream researcher Fiss (1995) states in his review that the following premises of Freud's could not be experimentally confirmed: the wish-fulfilment theory, the assumptions about the difference and the connection between latent and manifest dream content, the theory of the dream as the guardian of sleep and the role of repression in the dream work.

It can most likely be said in summary from today's perspective that the various dream theories that have been discussed until now elucidate important aspects of the meaning and function of dreaming. Equally, the dream's function cannot be reduced to any single one of these aspects. The dream certainly plays an important role in integrative processes in the psyche. Moreover, however, it also has a generative function for psychic growth, and furthermore obviously also for creativity and problem-solving. Also the importance of dream interpretation must be reassessed in relation to the reworking that is now evidently carried out by nocturnal dreaming entirely unconsciously, as it were, in the background.

Ermann suggests the following summary of the insights into dreaming and its psychic function for a contemporary psychoanalytic dream work:

In dreaming, information from completely different areas of perception and memory becomes connected. Unprocessed daytime impressions from the waking state are then perceived in sleep, such as a slight, a tempting situation, a task that was not mastered. These perceptions activate the centres that are responsible for the origination of dreams, which then begin to become connected with various memory stores and call up information from there. This activates memory contents that are similar to the day residue. These include experiences and emotional states but also conflicts and problems as well as mastery strategies and solutions. ... As a result of the dream mechanism something new arises that contains a better solution than the unprocessed initial information ... The function of the dream mechanism is primarily information processing as mastery of a problem by re-evaluation. It is an introduction to creative solutions and problem-solving. (2005, 68, translated quotation)

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