

Perception, conscious and unconscious processes

14

Patrizia Giampieri-Deutsch

Contents

Abstract	245	3.3 Consciousness as an ego function, the relation to perception and the metaphor of consciousness as a sense organ.	254
1. Introduction	246	4. Perception is not only a conscious process	255
2. Freud's models of the mind: the three phases	246	4.1 Non-conscious perception and neuropsychological syndromes	255
2.1 The "affect-trauma" model	246	4.2 Unconscious perception and subliminality studies	257
2.2 The topographical model	247	Outlook	260
2.3 The structural model	248	References	260
3. Consciousness in the different phases of Freud's conceptions of the mind.	250		
3.1 Consciousness as a quality of mental events	252		
3.2 Consciousness as a system of the topographical model	253		

Abstract

This chapter outlines Freud's conceptions of the mind and focuses on his understanding of consciousness and perception and of the unconscious mind. It also considers and discusses current debates on this topic in philosophy and cognitive science.

In philosophy perception and consciousness have often been conflated. In the wake of neuropsychological studies of brain-damaged patients and subliminality studies, the assumption that perception and consciousness of perception are always inseparable had to be revised. Several

neuropsychological syndromes clearly involve dissociations between perception (mostly vision) and awareness of perception, examples of which are blindsight, covert recognition of faces in prosopagnosia, unconscious perception of neglected stimuli, and implicit reading in alexia. In the case of these examples, all of the respective brain-damaged patients are processing visual information without the conscious experience of vision. Accordingly, after having successfully completed an experimental task by indirect testing they each claim to be merely "guessing". However, their non-conscious vision is latently rather than dynamically unconscious. Although the latent unconscious activity functions more or less like conscious activities do, it lacks awareness (for example, a latent unconscious perception is a non-conscious or a weak form of conscious perception; the dynamic unconscious is psychological, active, and can be different in character from conscious psychological process-

Patrizia Giampieri-Deutsch
University of Vienna
Institute of Philosophy
Universitätsstr. 7, room C0215
1010 Vienna, Austria
e-mail: patrizia.giampieri-deutsch@univie.ac.at

es). The impact of the dynamic unconscious on human mind and behavior is one of the main tenets of Freud's theory of the unconscious.

That is why subliminality studies raises additional challenging questions for cognitive neurobiology and cognitive psychology with regard to the understanding of unconscious dynamic processes. Experiments on subliminality suggest that the unconscious clinically described by dynamic psychiatry and psychoanalysis is indeed experimentally observable, and that it is in fact possible to investigate unconscious conflict, unconscious affect, and unconscious anxiety in a well controlled manner.

1. Introduction

Current psychoanalysis is characterized by its efforts to enter a dialogue with its neighboring disciplines such as cognitive psychology and cognitive neurobiology (as outlined by Giampieri-Deutsch 2002, 2004, 2005b, 2009, and 2010). In turn, neuroscientists like Kandel (2005), Panksepp (1999), Damasio (1999), Gallese (2006), and Roth (2004) among others, acknowledge basic psychoanalytic insights.

To counter their neglect of research on the mind, cognitive neurobiology and cognitive psychology recently started to investigate conscious as well as non-conscious processes. Their key interest no longer focuses on questions of the existence of unconscious processes alone, but is directed toward investigating experimentally their contribution to the mind, including the function of perception.

2. Freud's models of the mind: the three phases

In order to clarify the relationship between perception and consciousness and to move toward a distinction between the two, it is worth surveying Freud's conceptions of perception and consciousness over time, as elaborated in his models of the mind. Freud developed his conception of the mind, which he also termed "mental apparatus", progressively. Rapaport (1959) originally identified three phases and his point of view was further adopted by Sandler, Dare, and Holder: During a first pre-analytic phase (1886 to 1897) Freud elaborated his "affect-trauma" model; in a second phase (1897 to 1923) the topographical model emerged; and finally the third phase (after 1923) generated the structural model (Sandler et al. 1972).¹ In all his conceptions of the mind, Freud assumed the "mental apparatus" to be a tool for adaptation to demands from both the internal and external world.

2.1 The "affect-trauma" model

During the first pre-analytic phase between 1886 to 1897, Freud's conception of the mind was not explicitly formulated, but can be taken from his works and was first termed "affect-trauma" model by Sandler et al. (1972). At that time Freud emphasized the adaptation to the traumas deriving from external reality. He claimed that the occurrence of real external traumatic events

¹ Joseph Sandler, Alex Holder and Christopher Dare published eleven articles in the *British Journal of Medical Psychology* between 1972 and 1982 framing Freud's conceptualization of the mind; Holder then provided an outline in German (Holder 1982); finally the authors also published a synopsis in English (1997). Part 2 of this chapter is based on the results of their conceptual research. I am, furthermore, drawing from two articles (Giampieri-Deutsch 2008a and 2008b) as the starting point for part 2 and part 3 of this chapter.

arouses affects which the mental apparatus is not able to absorb or discharge and assumed a conscious perception of the real trauma.

In case they are incompatible with the consciousness of the subject, these conscious percepts, memories, representations as well as their related affects have to be dissociated by the ego and therefore become unconscious. The unconscious “constricted” affects along with the memories and associated representations could then again be released by bringing them back into consciousness. At that early stage Freud termed his treatment of patients the “cathartic method”, a therapy through abreaction and assimilation of the unconscious mental contents actively dissociated by the conscious part of the mind.

In his “Project for a scientific psychology”, Freud (1950c [1895], p. 308) first outlined how consciousness is linked to perception: “Consciousness gives us what are called *qualities*-sensations which are *different* in a great multiplicity of ways and whose *difference* is distinguished according to its relations with the external world. Within this difference there are series, similarities and so on, but there are in fact no quantities in it. It may be asked *how* qualities originate and *where* qualities originate.” Freud assumed the existence of a system of perceptual neurones (“omega” neurons) “whose states of excitation give rise to the various qualities – are, that is to say, *conscious sensations*.” (Freud 1950c, p. 309)

2.2 The topographical model

Although during the first phase, Freud had already distinguished between the conscious and unconscious mind, this distinction was only fully developed in his topographical model of the mental apparatus in the second phase from 1897 to 1923. The model is com-

posed of three systems: the System Unconscious, the System Preconscious, and the System Perception-Consciousness.

(i) The “System Unconscious” contains instinctual drives and wishes. These would represent a threat if they were allowed to emerge into consciousness, because they constantly strive toward discharge, gratification, and relief of painful tension according to what Freud termed the “pleasure principle”. Freud ascribed a number of characteristics to the System Unconscious, such as timelessness, the disregard of external reality, the overestimation of “psychic reality”, meaning that imagined experiences are – unconsciously – not distinguished from real events, the absence of contradiction, the absence of negation, and the equation of words with “things” (like a rebus).

Freud’s own contribution to the inquiry into the mind is the discovery of the dynamic unconscious. This marks his difference from Leibniz, Kant, and Helmholtz, and in “A note on the unconscious in psycho-analysis” Freud (Freud 1912g, p. 262) pointed out the novelty of his own concept of the unconscious: “The term *unconscious*, which was used in the purely descriptive sense before, now comes to imply something more. It designates not only latent ideas in general, but especially ideas with a certain dynamic character, ideas keeping apart from consciousness in spite of their intensity and activity.”

Regarding the role of aggression and sexuality in unconscious mental life, the legacy of the Darwinian revolution strongly impacted on Freud. In the words of Sulloway (1979, p. 276): “it was Darwin who handed Freud the most powerful instrument – namely, evolutionary theory’s stress upon the dynamic, the instinctual, and, above all, the *nonrational* in human behaviour.” Since neuroscientists like LeDoux (1996), Damasio (1999), and Edelman (1992) praise both Darwin and Freud as congenial partners for securing a privileged place for emotion in sci-

ence, contemporary evolutionary biology too as well as current psychoanalysis could benefit from rediscovering Freud.

(ii) The “System Preconscious” contains unconscious thoughts and memories that were not defended against. Some functions and capacities of the System Preconscious are: the preconscious scrutinizing of representations and feelings, the censoring of instinctual wishes and their derivatives, the storing of organized memory systems, the testing of reality, the binding of psychic energy, the control of access to consciousness and action, the control over the development of affects, the use of defense mechanisms, as well as the elaboration of creative productions and symptom formation.

(iii) The “System Perception-Consciousness” receives perceptual stimuli from both the external world and one’s own body (kinesthetic, proprioceptive, visceral – amongst others) and exercises the function of attention. External perceptual stimuli have to overcome a certain threshold or stimulus barrier before becoming conscious.

2.3 The structural model

The structural model, Freud’s conception of the mind during the third phase (after 1923), is composed of the three structures: id, ego and superego. It only partially replaced the topographical model, which continued to be applied where convenient.

In “The ego and the id” (Freud 1923), inaugurating this phase, the question of perception was at the core: “All perceptions which are received from without (sense-perceptions) and from within – what we call sensations and feelings – are Cs. [P. G.-D.: conscious] from the start. But what about those internal processes which we may – roughly and inexactly – sum up under the name of thought-processes?” (Freud 1923b, p. 19)

Therefore Freud asked how does something become conscious and answered that the first step is to ask how something becomes preconscious. Freud’s tentative reply to this second question was: “Through becoming connected with the word-presentations corresponding to it.” He continued further: “These word-presentations are residues of memories; they were at one time perceptions, and like all mnemonic residues they can become conscious again. Verbal residues are derived primarily from auditory perceptions, so that the system *Pcs.* [P. G.-D.: the System Preconscious] has, as it were, a special sensory source.” (Freud 1923b, pp. 20–21)

(i) The “id” is a structure already available at birth. It is the reservoir of the instinctual drives and wishes, as well as of repressed contents. Id contents are entirely unconscious and can be considered similar to those of the System Unconscious of the topographical model.

(ii) The “superego” has been differentiated from the id and from the ego, but a large part of it is still deeply unconscious. It functions as the agency of ideals and values, and as consciousness-prescribing rules transmitted by the parental figures.

(iii) The “ego” is the structure which developed from the id interacting with the external world in the interests of self preservation. “The ego is that part of the id which has been modified by the direct influence of the external world through the medium of the *Pcpt.-Cs.* [P. G.-D.: the System Perception-Consciousness]; in a sense it is an extension of the surface-differentiation.” Here Freud underscored once more the topic of perception: “Moreover, the ego seeks to bring the influence of the external world to bear upon the id and its tendencies, and endeavours to substitute the reality principle for the pleasure principle which reigns unrestrictedly in the id. For the ego, perception plays the part which in the id falls to instinct.” (Freud 1923b, p. 25) The ego copes with the con-

flicting demands of the id, the superego and the external world. A great part of the ego is also unconscious, meaning the ego can no longer be equated with consciousness, even if the id and the superego only have access to consciousness through the ego.

Freud discussed the relationship between perception and the body: "A person's own body, and above all its surface, is a place from which both external and internal perceptions may spring. It is *seen* like any other object, but to the *touch* it yields two kinds of sensations, one of which may be equivalent to an internal perception. Psychophysiology has fully discussed the manner in which a person's own body attains its special position among other objects in the world of perception. [...] The ego is first and foremost a bodily ego; it is not merely a surface entity, but is itself the projection of a surface. If we wish to find an anatomical analogy for it we can best identify it with the 'cortical homunculus' of the anatomists, which stands on its head in the cortex, sticks up its heels, faces backwards and, as we know, has its speech-area on the left-hand side." (Freud 1923b, pp. 25–26) In a later footnote of 1927 Freud further commented upon the relationship between the ego and the body: "I. e. the ego is ultimately derived from bodily sensations, chiefly from those springing from the surface of the body. It may thus be regarded as a mental projection of the surface of the body, besides, as we have seen above, representing the superficies of the mental apparatus." (Freud 1923b, p. 26)

In the structural model, consciousness is an ego function, which is connected with perception, and includes the metaphor of consciousness as a sense-organ of the ego.

Let us now address current interpretations. For a technically sound and impartial evaluation of Freud's complex understanding of the unconscious we turn to a comment by the neurobiologist Eric Kandel (2005, pp. 70–71). He distinguished three

different uses of the concept of the unconscious by Freud: "First, [Freud] used the term in a strict or structural way to refer to the *repressed* or *dynamic unconscious*. This unconscious is what the classical psychoanalytic literature refers to as the *unconscious*. It included not only the id but also that part of the ego which contains unconscious impulses, defenses, and conflicts and therefore is similar to the dynamic unconscious of the id. In this dynamic unconscious, information about conflict and drive is prevented from reaching consciousness by powerful defensive mechanisms such as repression."

Kandel then summarizes the second use of this term by Freud as being a second part of the ego that is unconscious, although not repressed, and therefore not involved with unconscious drives or conflicts. Unlike the "preconscious unconscious" – Freud's third use of the term unconscious, a merely descriptive one – this second unconscious part of the ego cannot become conscious, even though it is not repressed or conflicted. Kandel refers to this part as the "procedural unconscious", because it is concerned with habits as well as perceptual and motor skills. Kandel suggests that this second unconscious part of the Freudian ego appears to map onto what cognitive neurobiologists call "procedural memory".

A fundamental neurobiological insight is the distinction between procedural (implicit) and declarative (explicit) memory. Studying her amnesic patient H. M., Brenda Milner discovered in 1954 that the medial temporal lobe and the hippocampus mediate the declarative (explicit) memory storage (Scoville and Milner 1957). Declarative memory is the conscious recall of people, objects, and places: "It depends on the integrity of the medial temporal lobe and affords the capacity for conscious recollections about facts and events. Declarative memory is propositional – it can be true or false" (Milner et al. 1998, p. 450). In 1962 Milner discovered that even

in spite of the patient H. M.'s loss of his declarative memory, his procedural memory was preserved. H. M. was thus able to memorize implicitly and learn further perceptual and motor skills. His procedural (implicit) memories were unconscious: if their conscious recall failed, they were nonetheless evident in performance (Milner et al. 1998). Kandel connects the procedural processes of memory to different brain systems: "priming or recognition of recently encountered stimuli, is a function of sensory cortices; the acquisition of various cued feeling states involves the amygdale; formation of new motor (and perhaps cognitive) habits requires the neostriatum; learning new motor behavior or coordinates activities depends on the cerebellum" (Kandel 2005, pp. 70–73; see also Squire and Kandel 1999 as a general introduction). Commonly the two memory systems are used together: constant repetitions transform declarative conscious recollection into a procedural memory (e.g. learning to play the piano involves conscious memory at first, but playing becomes a non-conscious motor activity). According to Kandel, procedural memory provides a biological example of one component of unconscious mental processes.

Kandel also refers to Robert Clyman, who investigated memory in the context of emotion (Clyman 1991), and seeks to integrate the procedural unconscious into Freud's conceptions of the mind. After 1923, Freud's structural model of the mind distinguished between id, ego and superego. According to Kandel the procedural unconscious should be considered a part of the unconscious ego: "this unconscious part of the ego is never accessible to consciousness even though it is not repressed. Since this unconscious is concerned with habits and perceptual and motor skills, it maps onto procedural memory." (Kandel 2005, p. 71)

Similarly, Fonagy (1999, p. 218) linked procedural memory to the unconscious in

order to explain the efficacy of psychoanalytic treatment. Contrary to a still widespread assumption, Fonagy did not consider the therapeutic action of psychoanalysis as dependent upon the recovery of repressed memories of childhood, which are autobiographical declarative memories. In turn, he was also struck by the role of procedural memory in treatment, saying that "[p]sychic change is a function of a shift of emphasis between different mental models of object relationships. Change occurs in implicit memory leading to a change of the procedures the person uses in living with himself and with others."

3. **Consciousness in the different phases of Freud's conceptions of the mind**

In "The Oxford companion to the mind", Dennett (1987, p. 162) acknowledged that it was Freud who introduced the idea of "repressed unconscious activity [...] driven out of 'sight' of consciousness". At the same time, Dennett erroneously added that it was not until more recently that one began to understand that unconscious mental processes do not originate from active repression, and that on the contrary, the mind is unconscious from the beginning. Dennett equally mistakenly suggested that it is contemporary philosophy of mind which first asked the question: "Why does mental activity become conscious?"

From the beginning to his late work, Freud maintained two assumptions: first, that mental processes are in themselves unconscious, and second, that consciousness is available. Likewise he did not assume that only some mental activity is unconscious, for

example a repressed representation, but that mental processes are unconscious in themselves.³ Indeed, it was already implied in a remark at the beginning of his second paper on “The neuro-psychoses of defence” (Freud 1896b). In 1900, in “The interpretation of dreams,” Freud suggested very emphatically that “*the most complicated achievements of thought [...] are possible without the assistance of consciousness* – a fact which we could not fail to learn in any case from every psycho-analysis of a patient suffering from hysteria or from obsessional ideas.” (Freud 1900a [1899], p. 593, Freud’s italics) Similarly, Freud suggested, also in “The unconscious” (Freud 1915e, p. 171) and in “A difficulty in the path of psycho-analysis” (Freud 1917a, p. 143), that “mental processes are in themselves unconscious”. Further, in 1925 Freud defended his view in “The resistances to psychoanalysis”, pointing out that “what is mental is in itself unconscious and that being conscious is only a quality, which may or may not accrue to a particular mental act.” (Freud 1925e, p. 216)

Returning to Dennett’s misconception, Freud spelled out very clearly in “The ego and the id” that the unconscious does not overlap with the repressed: “We recognize that the *Ucs.* [P. G.-D.: the System Unconscious] does not coincide with the repressed; it is still true that all that is repressed is *Ucs.* [P. G.-D.: unconscious], but not all that is *Ucs.* [P. G.-D.: unconscious] is repressed. A part of the ego, too—and Heaven knows how important a part—may be *Ucs.* [P. G.-D.: unconscious], undoubtedly is *Ucs.* [P. G.-D.: unconscious].” (Freud 1923b, p. 18)

In turn, against the widely spread assumption that Freud scarcely paid any attention to consciousness, his few statements on the topic are worth mentioning here. According

to Freud even if mental processes are unconscious in themselves “if anyone speaks of consciousness we know immediately and from our most personal experience what [it] is meant to be.” (Freud 1940a [1938], p. 157) Further, when talking about the behaviorism of John B. Watson, who eliminated the term consciousness from his theoretical frame of reference, Freud stated: “One extreme line of thought, exemplified by the American doctrine of behaviorism, thinks it possible to construct a psychology, which disregarded this fundamental fact!” (Freud 1940a [1938], p. 157)

Regarding the relationship between consciousness and perception, it is worth noting that Freud described consciousness as emerging during the function of perception: “This system (*Pcpt.-Cs.* [P. G.-D.: System Perception-Consciousness]) is turned towards the external world, it is the medium for the perceptions arising thence, and during its functioning the phenomenon of consciousness arises in it.” (Freud 1933a [1932] p. 75) However in 1915 in “The unconscious” Freud had already conceded that “becoming conscious is no mere act of perception, but is probably also a *hypercathexis* [P. G.-D.: meaning a large amount of psychic energy], a further advance in the psychical organization.” (Freud 1915e, p. 194)

According to Freud’s “Outline of psycho-analysis,” consciousness is “a fact without parallel, which defies all explanation or description.” (Freud 1940a [1938], p. 157) “There is no need to characterize what we call ‘conscious’: it is the same as the consciousness of philosophers and of everyday opinion.” (Freud 1940a [1938], p. 159) Freud here is addressing “our most personal experience” – as Chalmers would put it – the “hard problem of consciousness”, a phenomenon which according to Chalmers cannot

² In the same vein see also Mark Solms (Solms 1997); Solms’ main topic in his article was indeed a Kantian understanding of Freud’s theory of consciousness that I do not discuss here.

be explained in terms of computational or neural mechanisms according to the standard methods of cognitive science or cognitive neurobiology (Chalmers 1996, 2007). To illustrate this issue further Chalmers adds: "Sometimes, terms such as 'phenomenal consciousness' or 'qualia' are also used here, but I – writes Chalmers – find it more natural to speak of 'conscious experience' or simply 'experience'" (Chalmers 2007, p. 226).

And yet, consciousness still remains one of the most neglected topics in psychoanalysis. Freud investigated the subject in one of the twelve writings that were to be collected in a comprehensive "Metapsychology". On the 12th of August 1915 Freud wrote to Ferenczi (letter F 560, Freud and Ferenczi 1996, p. 75): "The twelve papers are – so to speak – finished." However, Freud only published six chapters, and the article on consciousness disappeared. Freud wrote to Ferenczi on the 24th of March 1916: "I am thinking of abandoning the paper about the cs. [P.G.-D.: consciousness] and replacing it with a more appropriate one, for example, 'The Three Viewpoints of MΨ'" [P.G.-D.: Metapsychology] (letter F 603, Freud and Ferenczi 1996, p. 121)

3.1 Consciousness as a quality of mental events

By avoiding misleading accounts of Freud's work on consciousness, Shevrin (1997) provides a reliable classification of Freud's conceptions of consciousness: consciousness as a quality of mental events; consciousness as a system in the topographical model; and finally consciousness as an ego function in the structural model, which is connected with perception and includes the metaphor of consciousness as a sense organ.

The first conception (consciousness being a quality of mental events) is close to the clinical experience and cannot be ascribed

to one of the three phases of Freud's models of the mind. Although this model is available from the early pre-analytic writings to "The ego and the id" (Freud 1923b), it is best described in one of Freud's last writings, the posthumously published "An outline of psycho-analysis." In the chapter devoted to "Psychical qualities" he says: "Thus we have attributed three qualities to psychical processes: they are either conscious, preconscious or unconscious. The division between the three classes of material which possess these qualities is neither absolute nor permanent. What is preconscious becomes conscious, as we have seen, without any assistance from us; what is unconscious can, through our efforts, be made conscious, and in the process we may have a feeling that we are often overcoming very strong resistances." (Freud 1940a [1938], p. 160)

Shevrin points out how, according to this model, a representation can be "in three states vis-à-vis consciousness: it could be conscious, preconscious (easily acquiring the quality of consciousness), or unconscious (acquiring the quality of consciousness with difficulty). On this model one can say that the relationship of an idea to consciousness was operationally defined." (Shevrin 1997, p. 748)

Consciousness is a condition of subjective awareness. Both a threshold (or barrier) and intensity are part of this model. The threshold for a preconscious representation to become conscious is low. For a preconscious representation to become conscious is a function of its intensity. Our everyday perceptions develop from an initial preconscious to a conscious quality. The threshold for an unconscious representation (such as in repression) to become conscious, is much higher and may counteract even the most intense representation.

Fisher (1957) and Shevrin (1992, 1997) pointed to the compatibility of this model of consciousness with the findings of sublimin-

al perception (with which Freud's two other models – the System Perception-Consciousness and the sense organ of the ego – have trouble).

The model of consciousness as a quality of mental events is also clinically valuable: for example, if a patient cannot remember core events from the preceding session, the analyst assumes repression. Within this model, consciousness is a property of mental processes emerging under certain conditions. As the research of Shevrin (Shevrin et al. 1996) has shown, the questions of how consciousness emerges as a quality of a representation, and what psychological and neurophysiological conditions should be present for that to happen, can be studied in the consulting room as well as in the laboratory.

3.2 Consciousness as a system in the topographical model

In the topographical model, Freud elaborated the System Perception-Consciousness from the time of his "Project for a scientific psychology" (Freud 1950a [1895]) which equated perception with consciousness. Shevrin suggests that in this model the normal waking state is given primacy and provided with specific functions close to waking perception, such as reality testing⁴, attention and a capacity for self-reflection. Shevrin also remarks that something was lost in this model, Edelman's "primary consciousness" (1989) or Damasio's "core consciousness" (1999), that is to say, immediate subjective awareness without any accompanying reflectiveness, that which James (1890) described as the "stream of consciousness."

When conflating consciousness and perception, the latter always had to be conscious first, and any interaction between the external world and preconscious as well as unconscious processes became impossible. This did not correspond to our everyday psychoanalytic clinical experience. In addition, the results of neuropsychological investigations of brain-damaged patients (see further below) also ask for a revision of the assumption that perception and consciousness of perception are always inseparable. Also the whole tradition of psychoanalytic research into subliminal perception from Pötzl (1917) through Fisher (1954, 1956, 1957, 1959; Shevrin and Fisher 1967) to Howard Shevrin, shows how seriously researchers took the topic of unconscious percepts. Identifying perception with consciousness did not fit with the impressive results of subliminal research, in which it was repeatedly shown that external stimuli can be perceived subliminally and interact with unconscious processes, thereby producing dreams, images, and associations without any waking-state awareness of their source. Indeed, as early as 1919, in his re-edition of his "Interpretation of dreams", Freud himself made a positive comment on Otto Pötzl's findings on subliminality: "In a series of experiments Pötzl required the subjects to make a drawing of what they had consciously noted of a picture exposed to their view in a tachistoscope [P. G.-D.: an instrument for exposing an object to view for an extremely short time]. He then turned his attention to the dreams dreamt by the subjects during the following night and required them once more to make drawings of appropriate portions of these dreams. It was shown unmistakably that those details of the exposed picture which had not been noted by the subject

³ According to Freud the "testing of reality" is the capacity by which a distinction can be made between what is "unreal" (such as fantasies, memories, and dreams) and what are perceptual representations of something in the external world (Sandler et al. 1997, p. 92).

provided material for the construction of the dream, whereas those details which had been consciously perceived and recorded in the drawing made after the exposure did not recur in the manifest content of the dream.” (Freud 1900a, p. 181–182)

3.3 Consciousness as an ego function, the relation to perception and the metaphor of consciousness as a sense organ

In psychoanalysis, mental phenomena are explained as the outgrowth of conflict between (i) an instinctual (aggressive or sexual) wish and a defense against the wish, (ii) different intrapsychic structures (id, ego, super-ego), or (iii) an impulse in opposition to internalized demands of external reality. Therefore wishes are warded off by defensive techniques like repression, isolation, undoing, reaction formation⁴, among others. This has subsequently been known as the dynamic aspect of psychoanalysis and has also been adopted by current psychodynamic psychiatry (Hartmann 1959; Gabbard 2005). Freud developed the structural model of id, ego and superego because he had realized that the defenses against aggressive or sexual wishes belonging to the System Perception-Consciousness worked unconsciously. Following this clinical observation, Freud noticed the paradox of an unconscious process referring to a system controlled by consciousness. Consequently, by establishing the ego as a superordinate structure, Freud

not only assumed conscious, but also unconscious processes such as ego defenses within the ego.

Nonetheless consciousness belongs to the ego too, as Freud stated in his book “The ego and the id”: “It is to this ego that consciousness is attached [..]” (Freud 1923b, p. 17). Although the notion of consciousness as a specific ego function taking on the role of a sense organ was also available in Freud’s earlier writings, it was in the structural model that the “sense organ” metaphor was fully developed.

Shevrin criticizes Freud’s metaphor of consciousness as a sense organ, comparing it to similar analogies proposed by Francis Crick and other neuroscientists, who describe consciousness as a sort of light illuminating the dark regions of the world or our mind. According to Shevrin, the problem lies in the implicit assumption of a dualistic solution of the problem of consciousness. As Shevrin maintains, metaphors like a sense organ or light, lead to a new edition of the “homunculus” and cannot be supported by experimental evidence. Shevrin is one of few psychoanalytic scholars who resisted projecting dualism into Freud, who in fact regarded the physical and the mental as a causally connected “continuum”.⁵

⁴ For example, the defense “repression” operates by segregating unacceptable wishes, feelings, memories, or fantasies from consciousness; “isolation” of affect detaches affect from representation (e. g., a traumatic memory may be recalled but will be disconnected by any accompanying intense feelings); regarding “undoing”, a symbolic thought or action have to be performed to cancel out an unacceptable thought or action; “reaction formation” is characterized by defending against an unacceptable wish or impulse (e. g., aggressive wish) by adopting a character trait (e. g., compassion) completely opposed to it (Gabbard 2005).

⁵ We have evidence that Freud was fully aware of the philosophical discussion about the problems of the dualistic positions to the mind-body question. For example in “The unconscious,” in 1915, when he referred to “the insoluble difficulties of psycho-physical parallelism.” (Freud, 1915e, p. 168)

4. Perception is not only a conscious process

As early as 1910 Freud investigated “hysterical blindness” and for the first time clearly assumed the existence of a sort of unconscious perception: “Appropriate experiments have shown that people who are hysterically blind do nevertheless see in some sense, though not in the full sense. [. . .] Thus hysterically blind people are only blind as far as consciousness is concerned; in their unconscious they see. It is precisely observations such as this that compel us to distinguish between conscious and unconscious mental processes.” (Freud 1910, p. 212) Freud objected to French researchers such as Charcot, Janet, and Binet, who claimed that the cause of hysterical blindness was nothing but autosuggestion: “The hysterical patient is blind, not as the result of an autosuggestive idea that he cannot see, but as the result of a dissociation between unconscious and conscious processes in the act of seeing; his idea that he does not see is the well-founded *expression* of the psychical state of affairs and not its *cause*.” (Freud 1910, p. 212)

Hysterical blindness is not due to a lesion (as in the case of blindsight), the patients are physiologically entirely healthy. Freud assumes psychic conflict between desire and defence resulting in a temporary psychodynamic disturbance to be entirely solved by means of psychoanalytic treatment. This case study is relevant for Freud for the following reasons: not only does it differentiate between conscious and unconscious processing, but in particular it finally leads him to the assumption of unconscious perception.

Even though a number of neuroscientists like Edelson, Damasio, LeDoux, Panksepp, and others, are referring to Freud or psycho-

analysis, cognitive neurobiologists as well as cognitive psychologists in general only rarely appeal to psychoanalytic case studies when discussing conscious and unconscious processes (excepting Kandel and Roth). Recently, neuro-psychoanalysts upgraded the value of clinical research in psychoanalysis through the investigation of changes in personality, motivation, and emotion of brain-damaged patients in psychoanalysis or psychoanalytic therapy (Kaplan-Solms and Solms 2000; Solms 2004; Levin 2004, 2009).

In what follows we discuss far more conventional neuropsychological studies of brain-damaged patients, as their findings strongly impact on contemporary philosophy of mind and question the assumption that perception and consciousness of perception are always inseparable.

4.1 Non-conscious perception and neuropsychological syndromes

According to Weiskrantz “Blindsight has made us aware that there is more to vision than seeing, and more to seeing than vision.” (Weiskrantz 2007, p. 179)

The interest in “blindsight” was elicited by an article on clinical cases of four war veterans with cortical damages and residual visual function (Poppel et al. 1973). All these patients suffered from “cortical blindness”, i. e. they were blind because that part of the cortex providing visual consciousness did not work anymore. Poppel and colleagues described how blind patients were nevertheless reacting to visual stimuli. Weiskrantz, Warrington, Sanders, and Marshall termed this phenomenon “blindsight” (1974). Weiskrantz further investigated it. As he showed, in blindsight damaged primary visual cortex (striate cortex or area V1) causes blindness in parts of the affected visual fields. Even though blindsight patients have blind areas in their visual fields, they demon-

strate certain visual abilities when they are asked to make a “forced choice” and required to guess in indirect testing. Despite their residual abilities the patients say that they do not see anything and so are obviously unaware of their perception (Weiskrantz 1986, 1990, 1997, 1998, 2007).

In the case of “blindsight” as well as in the case of some other neuropsychological syndromes the function of perception (mostly vision) and the conscious experience of perception fall apart, visual processing and visual consciousness diverge. Since its discovery this phenomenon has continuously attracted the attention of a number of philosophers of mind such as van Gulick (1994), Block (1995), Chalmers (1996), Dretske (1995), Flanagan (1992; Güzeldere et al. 2000), and Searle (1979, 1992) (cf. Giampieri-Deutsch 2005a, pp. 17–18). Over the last 30 years, starting with Searle (1979) on blindsight, philosophers have discussed a number of other cases of brain-damaged patients with specific perceptual and cognitive deficits, but with access to stimuli that are not perceived consciously. “Prosopagnosics” report to be unable to recognize even the faces of their own relatives. However, indirect tests show evidence of “covert knowledge” of their facial expressions. Patients with “neglect” cannot report on the stimuli occurring on the contralesional side of space: even though their behavior suggests that they do not perceive them, they have non-conscious perception of neglected stimuli. Finally, “alexia” patients can no longer read words at a glance, but experiments provide evidence that they can read implicitly. All these patients are processing visual information, i. e. they have non-conscious visual perception without conscious experience of vision, so that when they succeed in completing an experimental task by indirect testing they claim to be “guessing” (cf. Farah 1994, 2001 for details on indirect testing).

Are these residual capacities to be related to a damaged but partly functioning primary visual pathway, or are they indicating alternative pathways for the visual system? The neurophysiological research on blindsight is still ongoing. The validity of blindsight has been questioned and some researchers explained residual functions by artifacts (Campion et al. 1983), or by spared cortical tissue (incomplete lesion) (Fendrich et al. 1992; Gazzaniga et al. 1994).

Undoubtedly, these phenomena are of great interest to philosophers of mind, because neuropsychological findings lead to a revision of the long-standing philosophical assumption that perceiving something is being aware of it. According to current philosophers of mind, phenomena such as blindsight allow an understanding of the nature and function of consciousness. Commenting on blindsight, Güzeldere, Flanagan and Hardcastle ask: “Does consciousness *necessarily* play a role in mental life, or could we do just as well without it?” (Güzeldere et al. 2000, p. 1279) Blindsight patients are missing consciousness of the stimuli in the blind part of the visual field and so fail to engage in some expected behavior. Therefore philosophers propose that consciousness has the capacity to cause that behavior. Consequently the philosophers answer their initial question, suggesting that “the lack of conscious awareness of the blind field partly explains the inability to bring the knowledge the system possesses into normal, high-quality play in inference, reporting, and action.” (Güzeldere et al. 2000, p. 1283)

The non-conscious vision of brain-damaged patients is unconscious in a merely descriptive sense; it is latently unconscious rather than dynamically unconscious. The latent unconscious activity functions more or less as conscious activities do, however it lacks awareness (e. g., a latent unconscious perception is a non-conscious or a weak form of conscious perception). The dynamic

unconscious is psychological, it is active, and it can be different in character from conscious psychological processes (cf. also below “4.2. Unconscious perception and subliminality studies”). But unconscious perception is not simply a weak form of conscious perception. That is why neuropsychological investigations as well as their philosophical inferences reach their limit here.

4.2 Unconscious perception and subliminality studies

Howard Shevrin (see also Chapter IV, 6 by H. Shevrin) provides a definition of the dynamic unconscious: “It is *psychological*, it is *active*, and it can be *different* in character from conscious psychological processes.” (Shevrin and Dickman 2003, p. 542). (i) The dynamic unconscious is *psychological*, meaning that the descriptive terminology used for conscious processes can be used for unconscious processes: perception, thought, affect, motivation, etc. Not only conscious processes are correlated with brain processes, but unconscious processes also. (ii) The dynamic unconscious is *active*, meaning that unconscious processes have a bearing on behavior and experience, even though the subject may be unaware of this. (iii) The dynamic unconscious can be *different* to conscious processes and follows different principles of organization than those which characterize processes occurring during the state of consciousness.

Shevrin reminds us that not just psychoanalysis, but also psychodynamic psychiatry as well as most other psychotherapy schools (and not merely the classical Jungian, Adlerian, and Sullivanian, but the more recent forms such as transactional analysis, gestalt therapy, and many others) share such a definition of the dynamic unconscious.

Regarding psychology at large, Shevrin asks himself about the possibility of formu-

lating two definitions of the unconscious – a “weak” and a “strong” definition. His “weak” definition of the unconscious recognizes that “psychological” unconscious processes exist and “actively” affect conscious processes. Shevrin’s “strong” definition of the unconscious points out, in addition, that “psychological” unconscious processes follow different principles of organization. In both his definitions of the unconscious Shevrin intentionally leaves out the role of motivational factors (e. g., drives) which psychodynamically oriented clinicians usually assume to be relevant.

According to Shevrin cognitive psychology seems to imply *psychological* unconscious processes in experiments on selective attention, subliminal perception as well as in visual phenomena involving perceptual processing (retinal image stabilization, binocular rivalry, and backward masking), thus providing indirect evidence in support of the *psychological* unconscious. Cognitive experiments on selective attention confirmed that cognitive activity occurs outside awareness, and that unconscious processes affect ongoing and subsequent conscious processes, and are therefore consistent with the *weak* definition of the unconscious. In cognitive experiments on subliminal perception it was additionally shown that unconscious complex activity is characterized by properties differing from those of conscious cognitive activity, thus supporting both the *weak* and the *strong* definition of the unconscious. Visual phenomena involving perceptual processing such as retinal image stabilization, binocular rivalry, and backward masking can be considered to indirectly support the *weak* definition of unconscious. From his detailed review of these above mentioned experiments Shevrin drew three conclusions: first, the initial cognitive stage for all stimuli occurs outside of consciousness; second, the initial non-conscious cognitive stage is psychological, active on consciousness and can

follow principles of organization differing from conscious cognition; and third, consciousness of stimulus is a later and optional stage in cognition. Consequently Shevrin poses the crucial question: what factors may determine the emergence of a stimulus into consciousness or inhibit it, respectively. Shevrin's answer is: first, stimulus factors such as loudness, brightness, figural coherence, etc.; second, factors concerning the state of the receiver, such as level of arousal, sleep stage, fatigue, distractibility, etc.; and third motivational factors, such as avoidance of anxiety, guilt, conflict, etc. (Shevrin and Dickman 2003).

Indeed, there are plenty of research studies on unconscious processes (Marcel 1983; Velmans 1991; Merikle and Daneman 2000; Cheesman and Merikle 2003) in cognitive psychology, but little consensus regarding unconscious motivational factors. Although psychodynamic psychiatry and psychoanalysis have provided a wide range of clinical evidence since the New Look's debate in psychology (cf. Erdelyi 1974) to the present day, topics such as "dynamic unconscious" or "unconscious motivational factors" are still treated with caution.

Apart from clinical investigations in psychoanalysis, a less known ongoing experimental tradition of psychoanalytic research is worth mentioning. Carried out by Pötzl (1917), Benussi (1923, 1925, 1927), Fisher (1954, 1956, 1957, 1959), Luborsky (1988; Shevrin and Luborsky 1958), and Holt (1968, 1989), its efforts culminated in the long-standing research program of Howard Shevrin (1992, 2000, 2004, 2005; Wong et al. 1994; 1997; Snodgrass and Shevrin 2006), and aimed at proving the activity of the dynamic unconscious by experimental findings. Therefore, having moved from Freud to contemporary psychoanalysis and to the most recent experiments within the long tradition of subliminal perception in psychoanalysis, the work of Howard Shevrin has been well

known and valued for many years, and quoted not only by cognitive neurobiologists such as Kandel, Panksepp and Damasio, but also by cognitive psychologists such as Merikle and Erdelyi (see also Chapter IV, 16 by MH Erdelyi). A few years ago, the cognitive psychologist Erdelyi published a key-article on subliminal perception followed by a discussion providing a particularly striking appreciation and substantiation of Shevrin's approach (Erdelyi 2004a, 2004b; Kihlstrom 2004; Bachmann 2004; Snodgrass 2004; Reingold 2004).

Over the last decades, the main clinical research approach or "case study method" in psychoanalysis has grown fast by incorporating the methodologies and concepts of its neighboring disciplines. Neuropsychanalysis is now bridging the neurosciences and psychoanalysis, enhancing the image of Freud as "biologist of the mind" (Sulloway 1979). Within cognitive neurobiology and cognitive psychology, research of unconscious processes has become a field of increasing importance. It concerns central topics, such as implicit learning, procedural memory, and subliminal perception. Until now, methodological and theoretical difficulties have complicated the seminal transfer of knowledge between disciplines. Shevrin and his colleagues made a substantial contribution to the convergence of cognitive neurobiology, cognitive psychology, and psychoanalysis (cf. Shevrin et al. 1996; Shevrin 2004).

Assuming a continuum between physical and mental phenomena, Freud had to forgo a description of neurobiological processes underlying the mind because the neurobiology of his day was not yet sufficiently developed. To find neurobiological correlations for mental states seems possible now and some insights of contemporary neurobiology converge creating novel paths for research in psychoanalysis. In an interdisciplinary dialogue, three areas of psychoanalysis are backed up by consolidated findings of neuro-

biology: (i) The importance of early object relations and early experiences and the correlating vulnerability for both mental disorders and physical diseases (Fonagy 2001; Hofer 2001; Kandel 2005, cf. pp. 79–86; Trevarthen 2001; Trevarthen and Reddy 2007). (ii) Psychoanalytic therapy has been shown to be a treatment of the mind bringing about not only mental but also neurobiological modification. Kandel suggested that these structural changes in the brain could be visualized by studies using brain imaging techniques (Kandel 2005, cf. pp. 91–93, p. 386–387). (iii) The dynamic unconscious (still controversially discussed) as part of the mind can be made observable (e. g. by studies on subliminal perception) and does not have to be merely inferred.

Shevrin's remarkable research endeavors using the subliminality approach has been praised by the neurobiologist Eric Kandel, who said that "the important and long-standing tradition of work by Howard Shevrin, [that] correlate[s] the perception of subliminal and supraliminal stimuli with event-related potentials in the brain in an attempt to analyze aspects of unconscious mental processes." Kandel (2005, p. 96) suggests following the seminal work of Shevrin because we "need to develop creative ways of studying subjective phenomena".

In Shevrin's research design, first-person information (patient accounts of their understanding of their own symptoms) is combined with third-person cognitive psychometrics as well as neurophysiological measures. In this way evidence is provided for dynamic motivational unconscious processes, showing that they are active and controlled rather than merely automatic (Shevrin 2000, cf. Velmans 2000, p. 5; Shevrin 2004). Shevrin could also show that in general, all unconscious processes are individual and deeply influenced by the history of the subject (Shevrin 2004, 2005).

Even though the problem of unconscious affect is discussed in cognitive neurobiology, in cognitive psychology, and in psychoanalytic theory, a unified theory of affects is still a desideratum. The findings of Shevrin and colleagues provide evidence for the assumption of actual unconscious affects and against the concept of affects existing as mere "dispositions". This result was gained by an interdisciplinary pluralism of methods meeting the strictest scientific standards. It yields important possibilities for the integration of theoretical aspects coming from different research traditions toward a more coherent theory of mind.

Among Shevrin's countless subtle experiments dealing with unconscious affects, at least two samples are worth mentioning here. In a first experiment, subjects were exposed subliminally and supraliminally to twenty words having either positive or negative emotional meaning. These emotional valences were determined by having subjects rate the words on the evaluative scales developed by Osgood et al. (1975). The event-related potential (ERP) of each subject, derived from the electroencephalographic (EEG) record, was measured. During the supraliminal presentation, the ERPs following the presentation of emotionally negative words were more positive in voltage than those to the emotionally positive words. Interestingly, the difference of subliminal ERPs between emotionally negative and positive words is greater on the left than on the right side of the brain; there is a brain lateralization effect. This is not the case for the supraliminal presentation. On the basis of these results the experiment shows that the meaning of each affect is registered unconsciously. Shevrin concludes that unconscious processes differentiate between positive and negative meanings or valences without consciousness (Bernat et al. 2001; Shevrin 2000, 2004).

Since affects have expressive and physiological dimensions, in another experiment

Shevrin and colleagues have shown that a schematic face aversively conditioned subliminally causes greater facial tension in particular in the corrugator muscle above the eyes which indicates a negative emotional expression as in a frown (Bunce et al. 1999; Shevrin 2000, 2004).

Finally, in his paper “Toward a theory on consciousness based on recent developments in subliminal research”, Shevrin holds that the relationship between conscious and unconscious processes is a key question in current cognitive psychology and neurobiology. Outlining a number of his own studies, Shevrin provides experimental evidence for the following four propositions: To begin with, Shevrin thinks that consciousness cannot be fully understood without a concomitant understanding of unconscious processes. Further, unconscious processes are dynamic that is complex, representational, and highly interactive with conscious processes, and not merely dispositional or latent. Then, the interaction between conscious and unconscious processes can best be understood when both person and context are taken into account. Finally, there are quantitative and qualitative differences between conscious and unconscious processes that can best be seen as a function of these individual differences (Shevrin 2005).

Outlook

In his “Biology and the future of psychoanalysis” of the year 1999, Kandel not only praised psychoanalysis as still being “the most coherent and intellectually satisfying view of the mind” (Kandel 2005, p. 64), but also complained about the “failure of psychoanalysis to provide objective evidence that it is effective as a therapy”, including the evidence that it works better than non-analytically oriented therapy (Kandel 2005, p. 97). However, the researchers inside the psychoanalytic community were quite well acquainted with the seminal publication of Peter Fonagy, “An open door of outcome studies in psychoanalysis,” which summarizes these ef-

forts, but was hardly noticed from the outside (Fonagy 2002).

In the meantime the situation has changed. A number of independent key-articles published in medical, psychiatric, and psychological – not psychoanalytical – journals provide empirical evidence of the efficacy of long-term psychodynamic therapy. Additionally, therapeutic gains were shown to be lasting and patients continue to improve after their treatment (Leichsenring and Rabung 2008; 2011; Leichsenring et al. 2009; Shedler 2010).

Even short psychodynamic therapies yield significant, large, and stable improvements, just as cognitive-behavioral therapies do (Leichsenring et al. 2009). Furthermore, non-psychodynamic therapies may be successful in part because the more effective therapists utilize techniques that have long been central to psychoanalytic theory and practice (Shedler 2010).

In a recent article, the cognitive psychologist Jonathan Shedler concludes: “Presentations that equate psychoanalysis with dated concepts that last held currency in the psychoanalytic community in the early 20th century are similarly misleading: they are at best uninformed and at worst disingenuous.” (Shedler 2010, pp. 106–107)

References

- The chronological order of Freud’s writings is based on the bibliography:
- Meyer-Palmedo I, Fichtner G (eds) (1989). Freud-Bibliographie mit Werkkonkordanz [Freud-bibliography with concordance of his publications]. Fischer, Frankfurt am Main, pp 15–90
- Bachmann T (2004) Inaptitude of the signal detection theory, useful vexation from the microgenetic view, and inevitability of neurobiological signatures in understanding perceptual (un) awareness. *Conscious Cogn* 13: 101–106
- Benussi V (1923) La suggestione e l’ipnosi come mezzo di analisi psichica reale. In: *Atti del IV Congresso Nazionale di Psicologia*. Bandettini, Firenze 1925, pp 35–65
- Benussi V (1925) La suggestione e l’ipnosi come mezzo di analisi psichica reale. Zanichelli, Bologna
- Benussi V (1927) Zur experimentellen Grundlegung hypnosuggestiver Methoden psychischer Analyse. *Psychol Forsch* 9: 197–274

- Bernat E, Bunce SC, Shevrin H (2001) Event-related brain potentials differentiate positive and negative mood adjectives during both supraliminal and subliminal processing. *Int J Psychophysiol* 42: 11–34
- Block N (1995) On a confusion about a function of consciousness. *Behav Brain Sci* 18: 227–247 [reprint in: Block N, Flanagan O, Güzeldere G (eds) *The nature of consciousness. Philosophical debates*. MIT Press, Cambridge, MA 1997, pp 375–415]
- Bunce SC, Bernat E, Wong PS, Shevrin H (1999) Further evidence for unconscious learning: preliminary support for the conditioning of facial EMG to subliminal stimuli. *J Psychiatr Res* 33: 341–347
- Campion J, Latto R, Smith Y (1983) Is blindsight an effect of scattered light, spared cortex, and near-threshold vision? *Behav Brain Sci* 6: 423–86
- Chalmers D (1996) *The conscious mind*. Oxford University Press, Oxford
- Chalmers D (2007) The hard problem of consciousness. In: Velmans M, Schneider S (eds) *The Blackwell companion to consciousness*. Blackwell Publishing, Malden MA Oxford, pp 225–235
- Cheesman J, Merikle PM (2003) Distinguishing conscious from unconscious perceptual processes. In: Baars BJ, Banks WP, Newman JB (eds) *Essential sources in the scientific study of consciousness*. MIT Press, Cambridge, MA, pp 519–540 [original in: *Canadian J of Psychology* 40: 343–367]
- Clyman R (1991) The procedural organization of emotion: a contribution from cognitive science to the psychoanalytic theory of therapeutic action. *J Am Psychoanal Assoc* 39: 349–381
- Damasio A (1999) *The feeling of what happens. Body and emotion in the making of consciousness*. William Heinemann, London
- Dennett DC (1987) Consciousness. In: Gregory RL (ed) *The Oxford companion to the mind*. Oxford University Press, Oxford
- Dretske F (1995) *Naturalizing the mind*. MIT Press, Cambridge, MA
- Edelman GM (1989) *The remembered present. A biological theory of consciousness*. Basic Books, New York
- Edelman GM (1992) *Bright air, brilliant fire. On the matter of the mind*. Basic Books, New York
- Erdelyi MH (1974) A new look at New Look: Perceptual defense and vigilance. *Psychol Rev* 81: 186–190
- Erdelyi MH (2004a) Comments on commentaries: Kihlstrom, Bachmann, Reingold, and Snodgrass. *Conscious Cogn* 13: 430–433
- Erdelyi MH (2004b) Subliminal perception and its cognates: theory, indeterminacy, and time. *Conscious Cogn* 13: 73–91
- Farah MJ (1994) Visual perception and visual awareness after brain damage: a tutorial overview. In: Umiltà C, Moscovitch M (eds) *Attention and performance*. MIT Press, Cambridge, MA, pp 37–75 [reprint in: Block N, Flanagan O, Güzeldere G (eds) *The nature of consciousness. Philosophical debates*. MIT Press, Cambridge, MA 1997, pp 203–236]
- Farah MJ (2001) Consciousness. In: Rapp B (ed) *The handbook of cognitive neuropsychology: what deficits reveal about the human mind*. Psychology Press/Taylor & Francis, London
- Fendrich R, Wessinger CM, Gazzaniga MS (1992) Residual vision in a scotoma: implications for blindsight. *Science* 258: 1489–1491
- Fisher C (1954) Dreams and perception: The role of preconscious primary modes of perception in dream formation. *J Am Psychoanal Assoc* 2: 389–445
- Fisher C (1956) Dreams, images, and perception: a study of unconscious-preconscious relations. *J Am Psychoanal Assoc* 4: 5–48
- Fisher C (1957) A study of the preliminary stages of the construction of dreams and images. *J Am Psychoanal Assoc* 5: 60–87
- Fisher C (1959) Further observations on the Pötlz phenomenon: The effects of subliminal visual stimulation on dreams, images, and hallucinations. *Psychoanalysis and Contemporary Thought* 11 (1984): 3–56 [original in: *Evol Psychiatr* 4 (1959): 551–566]
- Flanagan O (1992) *Consciousness reconsidered*. MIT Press, Cambridge, MA
- Fonagy P (1999) Memory and therapeutic action. *Int J Psychoanal* 80: 215–224
- Fonagy P (2001) *Attachment theory and psychoanalysis*. Other Press, New York
- Fonagy P (ed) (2002) *An open door review of outcome studies in psychoanalysis*. 2nd edn. International Psychoanalytical Association, London
- Freud S (1896b) Further remarks on the neuro-psychoses of defence. In: *The Standard Edition of the complete psychological works of Sigmund Freud (SE) vol 3*. London, Hogarth Press, pp 162–185
- Freud S (1900a) The interpretation of dreams. In *SE vol 4–5*

- Freud, S. (1910i) The psycho-analytic view of psychogenic disturbance of vision. In: SE vol 11, pp 211–218
- Freud, S. (1912g) A note on the unconscious in psycho-analysis. In: SE vol 12, pp 260–266
- Freud S (1915e) The unconscious. In: SE vol 14, pp 166–204
- Freud S (1917a) A difficulty in the path of psycho-analysis. In: SE vol 17, pp 137–144
- Freud S (1923b) The ego and the id. In: SE vol 19, pp 12–59
- Freud S (1925e) The resistances to psychoanalysis. In: SE vol 19, pp 213–224
- Freud S (1933a [1932]) New introductory lectures on psycho-analysis. In: SE vol 22, pp 1–182
- Freud S (1940a [1938]) An outline of psycho-analysis. In: SE vol 23, pp 144–207
- Freud S (1950c [1895]) Project for a scientific psychology. In: SE vol 1, pp 295–397
- Freud S, Ferenczi S (1996) The correspondence of Sigmund Freud and Sándor Ferenczi 1914–1919, vol 2, Brabant E, Falzeder E, Giampieri-Deutsch P (eds) Harvard University Press, Cambridge, MA
- Gabbard G O (2005) Psychodynamic psychiatry in clinical practice. 4thedn American Psychiatric Publishing Inc, Washington, London
- Gallese V (2006) Mirror neurons and intentional attunement: Commentary on Olds. *J Am Psychoanal Assoc* 54/1: 47–57
- Gazzaniga MS, Fendrich R, Wessinger CM (1994) Blindsight reconsidered. *Curr Dir Psychol Sci* 3: 93–96
- Giampieri-Deutsch P (ed) (2002) Psychoanalyse im Dialog der Wissenschaften. Europäische Perspektiven, vol 1. Kohlhammer, Stuttgart
- Giampieri-Deutsch P (ed) (2004) Psychoanalyse im Dialog der Wissenschaften. Anglo-amerikanische Perspektiven, vol 2. Kohlhammer, Stuttgart
- Giampieri-Deutsch P (2005a) Approaching contemporary psychoanalytic research. In: Giampieri-Deutsch P (ed) Psychoanalysis as an empirical, interdisciplinary science. Verlag Österr Akad Wiss, Wien, pp 15–53
- Giampieri-Deutsch P (ed) (2005b) Psychoanalysis as an empirical, interdisciplinary science. Collected papers on contemporary psychoanalytic research. Verlag Österr Akad Wiss, Wien
- Giampieri-Deutsch P (2008a) Die Erkenntnis des Geistes, Mentalen in der Psychoanalyse. In: Appel K, Weber HP, Langthaler R, Müller S (eds) Naturalisierung des Geistes? Beiträge zur gegenwärtigen Debatte um den Geist. Königshausen & Neumann, Würzburg, pp 135–150
- Giampieri-Deutsch P (2008b) Zur Erkenntnis des Bewusstseins: Perspektiven aus der Psychoanalyse und aus der analytischen Philosophie des Geistes unter Berücksichtigung der experimentellen Wissenschaften. In: Gloy K (ed) Kollektiv- und Individualbewusstsein. Königshausen & Neumann, Würzburg, pp 87–107
- Giampieri-Deutsch P (ed) (2009) Geist, Gehirn, Verhalten: Sigmund Freud und die modernen Wissenschaften. Königshausen & Neumann, Würzburg
- Giampieri-Deutsch P (2010) Some remarks on psychoanalytic research and universities. *Int Forum Psychoan* 19/4: 210–217
- Güzeldere G, Flanagan O, Hardcastle VG (2000) The nature and function of consciousness: lessons from blindsight. In: Gazzaniga M (ed) The new cognitive neurosciences. MIT Press, Cambridge, MA, pp 1277–1284
- Hartmann H (1959) Psychoanalysis as a scientific theory. In: Hook S (ed) Psychoanalysis, scientific method, and philosophy. New York University Press, New York, pp 3–37
- Hofer M (2001) Origins of attachment and regulators of development within early social interactions: from animal to human. In: Kalverboer A F, Gramsbergen A (eds) Handbook of brain and behaviour in human development. Kluwer, Dordrecht, Boston, London, pp 821–840
- Holder A (1982) Freuds Theorie des psychischen Apparats. In: Eicke D (ed) Tiefenpsychologie vol 1. Beltz Verlag, Weinheim, Basel
- Holt RH (1968) Manual for the scoring of primary-process manifestations in Rorschach responses. 10th edn Research Center for Mental Health, New York University, New York
- Holt RH (1989) Freud reappraised. A fresh look at psychoanalytic theory. The Guilford Press, New York, London
- James W (1890) The principles of psychology. Harvard University Press, Cambridge, MA 1981
- Kandel E (2005) Psychiatry, psychoanalysis and the new biology of the mind. American Psychiatric Publishing, Washington, DC, London
- Kaplan-Solms K, Solms M (2000) Clinical studies in neuro-psychoanalysis. Introduction to a depth neuropsychology. Karnac Books, London, New York
- Kihlstrom JF (2004) Availability, accessibility, and subliminal perception. *Conscious Cogn* 13: 92–100

- LeDoux J (1996) *The emotional brain. The mysterious underpinnings of emotional life.* Simon and Schuster, New York
- Leichsenring F, Rabung S (2008). Effectiveness of long-term psychodynamic psychotherapy: a meta-analysis. *J Am Medical Assoc* 300 (13): 1551–1565
- Leichsenring F, Rabung S (2011) Long-term psychodynamic psychotherapy in complex mental disorders: update of a meta-analysis. *Br J Psychiatry* 199: 15–22
- Leichsenring F, Salzer S, Jaeger U, Kächele H, Kreische R, Leweke F, Rueger U, Winkelbach C, Leibing E (2009). Short-term psychodynamic psychotherapy and cognitive-behavioral therapy in generalized anxiety disorder: a randomized, controlled trial. *Am J Psychiatry* 166(8): 875–81
- Levin F (2004) Das exekutive Aufmerksamkeitsnetzwerk (ECN), selektive Aufmerksamkeit und kognitives Defizit: Mögliche Mechanismen der Lernstörung (LS) und der Aufmerksamkeitsdefizitstörung (ADS). In: Giampieri-Deutsch P (ed) *Psychoanalyse im Dialog der Wissenschaften. Anglo-amerikanische Perspektiven, vol 2.* Kohlhammer, Stuttgart, pp 192–212
- Levin F (2009) Emotion and the psychodynamics of the cerebellum (CB): a neuro-psychoanalytic analysis and synthesis. In: Giampieri-Deutsch P (ed) *Geist, Gehirn, Verhalten: Sigmund Freud und die modernen Wissenschaften.* Königshausen & Neumann, Würzburg, pp 67–83
- Luborsky L (1988) Recurrent momentary forgetting: its contents and its context. In: Horowitz M (ed) *Psychodynamics and cognition.* University of Chicago Press, Chicago, pp 223–251
- Marcel AJ (1983) Conscious and unconscious perception: an approach to the relations between phenomenal experience and perceptual processes. *Cogn Psychol* 15: 238–300
- Merikle PM, Daneman M (2000) Conscious vs. unconscious perception. In: Gazzaniga M (ed) *The new cognitive neurosciences.* MIT Press, Cambridge, MA, pp 1295–1303
- Milner B, Squire L R, Kandel E R (1998) Cognitive neuroscience and the study of memory. *Neuron* 20: 445–468
- Musatti C (1957) *Coscienza e inconscio nelle ricerche sperimentali di Vittorio Benussi.* Riv Psicol 51: 3–23
- Osgood CE, May WH, Myron MS (1975) *Cross-cultural universals of affective meaning.* University of Illinois Press, Urbana
- Panksepp J (1999) Emotions as viewed by psychoanalysis and neuroscience: an exercise in consilience. *Neuro-psychoanal* 1: 15–38
- Poppel E, Held R, Frost D (1973) Residual function after brain wounds involving the central visual pathways in man. *Nature* 243: 295–96
- Pötzl O (1917) Experimentell erregte Traumbilder in ihrer Beziehungen zum indirekten Sehen. *Z Gesamte Neurol Psychiatr* 37: 278–349
- Rapaport D (1959) *A historical survey of psychoanalytic ego psychology.* Psychol Issues, vol 1, Monograph 1. International Universities Press, New York
- Reingold EM (2004) Unconscious perception: assumptions and interpretive difficulties. *Conscious Cogn* 13: 117–122
- Roth G (2004) Wie das Gehirn die Seele macht. In: Giampieri-Deutsch P (ed) *Psychoanalyse im Dialog der Wissenschaften. Anglo-amerikanische Perspektiven, vol 2.* Kohlhammer, Stuttgart, pp 171–191
- Sandler J, Dare C, Holder A (1972) Frames of reference in psychoanalytic psychology. II. The historical context and phases in the development of psychoanalysis. *Br J Med Psychol* 45: 133–142
- Sandler J, Holder A, Dare C (1997) *Freud's models of the mind.* Karnac books, London
- Scoville W B, Milner B (1957) Loss of recent memory after bilateral hippocampal lesions. *J Neurol Neurosurg Psychiatr* 20: 11–21
- Searle J (1979) *Expression and meaning. Studies in the theory of speech acts.* Cambridge University Press, Cambridge, MA
- Searle J (1992) *The rediscovery of the mind.* MIT Press, Cambridge, MA
- Shedler J (2010) The efficacy of psychodynamic psychotherapy. *Am Psychol* 65: 98–109
- Shevrin H (1992) Subliminal perception, memory, and consciousness: Cognitive and dynamic perspectives. In: Bornstein RF, Pittman TS (eds) *Perception without awareness: cognitive, clinical, and dynamic perspectives.* Guilford Press, New York, pp 123–142
- Shevrin H (1997) Commentaries. *J Am Psychoanal Assoc* 45: 746–753
- Shevrin H (2000) The experimental investigation of unconscious conflict, unconscious affect, and unconscious signal anxiety. In: Velmans M (ed) *Investigating phenomenal consciousness.* John Benjamins Publ Comp, Amsterdam, Philadelphia, pp 33–65

- Shevrin H (2004) Die experimentelle Untersuchung von unbewusstem Konflikt, unbewusstem Affekt und unbewusster Signalangst. In: Giampieri-Deutsch P (ed) *Psychoanalyse im Dialog der Wissenschaften. Anglo-amerikanische Perspektiven*, vol 2. Kohlhammer, Stuttgart, pp 114–142
- Shevrin H (2005) Toward a theory on consciousness based on recent developments in subliminal research. In: Giampieri-Deutsch P (ed) *Psychoanalysis as an empirical, interdisciplinary science*. Verlag Österr Akad Wiss, Wien, pp 57–74
- Shevrin H, Bond J, Brakel L, Hertel R, Williams W (1996) *Conscious and unconscious processes. Psychodynamic, cognitive, and neurophysiological convergences*. Guilford Press, New York, London
- Shevrin H, Dickman S (2003) The psychological unconscious: a necessary assumption for all psychological theory? In: Baars BJ, Banks WP, Newman JB (eds) *Essential sources in the scientific study of consciousness*. MIT Press, Cambridge, MA pp 541–538
- Shevrin H, Fisher C (1967) Changes in the effects of a waking subliminal stimulus as a function of dreaming and nondreaming sleep. *J Abnorm Psychol* 72(4): 362–368
- Shevrin H, Luborsky L (1958) The measurement of preconscious perception in dreams and images: An investigation of the Poetzl phenomenon. *J Abnorm Soc Psychol* 56: 285–294
- Snodgrass M (2004) The dissociation paradigm and its discontents: How can unconscious perception or memory be inferred? *Conscious Cogn* 13: 107–116
- Snodgrass M, Shevrin H (2006) Unconscious inhibition and facilitation at the objective detection threshold: Replicable and qualitatively different unconscious perceptual effects. *Cognition* 101(1): 43–79
- Solms M (1997) What is consciousness? *J Am Psychoanal Assoc* 45: 681–703 and 765–778
- Solms M (2004) Ein Beispiel aus der neuropsychologischen Forschung: Das Korsakow-Syndrom. In: Giampieri-Deutsch P (ed) *Psychoanalyse im Dialog der Wissenschaften. Anglo-amerikanische Perspektiven*, vol 2. Kohlhammer, Stuttgart, pp 213–228
- Squire L R, Kandel E R (1999) *Memory: from mind to molecules*, Scientific American Library, New York
- Sulloway F J (1979) *Freud, biologist of the mind*. Burnett, London
- Trevarthen C (2001) The neurobiology of early communication: Intersubjective regulations in human brain development. In: Kalverboer A F, Gramsbergen A (eds) *Handbook of brain and behaviour in human development*. Kluwer, Dordrecht, Boston, London, pp 841–881
- Trevarthen C, Reddy V (2007) Consciousness in infants. In: Velmans M, Schneider S (eds) *The Blackwell companion to consciousness*. Blackwell Oxford, pp 41–57
- van Gulick R (1994) Deficit studies and the function of phenomenal consciousness. In: Graham G, Stephens GL (eds) *Philosophical psychopathology*. MIT Press, Cambridge, MA
- Velmans M (1991) Is human information processing conscious? *Behav Brain Sci* 14: 651–726
- Velmans M (2000) An introduction to investigating phenomenal consciousness. In: Velmans M (ed) *Investigating phenomenal consciousness*. John Benjamins Publ Comp, Amsterdam, Philadelphia, pp 1–15
- Weiskrantz L (1986) *Blindsight: a case study and implications*. Oxford University Press, Oxford
- Weiskrantz L (1990) Outlooks for blindsight: Explicit methodologies for implicit processes. *Proc R Soc Lond B Biol Sci* 239: 247–78
- Weiskrantz L (1997) *Consciousness lost and found*. Oxford University Press, Oxford
- Weiskrantz L (1998) *Blindsight: a case study and implications*. 2nd edn. Oxford University Press, Oxford
- Weiskrantz L (2007) The case of blindsight. In: Velmans M, Schneider S (eds) *The Blackwell companion to consciousness*. Blackwell Publishing, Malden MA Oxford, pp 175–180
- Weiskrantz L, Warrington EK, Sanders MD, Marshall J (1974) Visual capacity in the hemianopic field following a restricted occipital ablation. *Brain* 97: 709–728
- Wong PS, Bernat E, Bunce SC, Shevrin H (1997) Brain indices of nonconscious associative learning. *Conscious Cogn* 6, 519–544
- Wong PS, Shevrin H, Williams WJ (1994) Conscious and nonconscious processes: An ERP index of an anticipatory response in a conditioning paradigm using visually masked stimuli. *Psychophysiol* 35, 87–101