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Psychoanalysis as Science

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Martin Hoffmann

Contents

Abstract

Psychoanalysis is one of the most prominent and most intensely discussed research programs of the twentieth century. One important debate in the philosophy of medicine centers around the question of whether or not psychoanalysis is a scientific research program. The paradigm case for the evaluation of this question is the theory of Sigmund Freud, who – in contrast to Carl G. Jung, Alfred Adler, and other proponents of psychoanalytic theory – regarded his theoretical efforts as a scientific project throughout his whole life. His project was continued by researchers in psychology and medicine, as well as

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practitioners in clinical psychotherapy and psychiatry. In order to give a more elaborate answer to the question of the extent to which this project is judged to be successful in contemporary science, it is necessary to differentiate between psychoanalytic theory, psychodynamic therapy, and the research methodology applied in the Freudian tradition.

Even if Freud himself took psychoanalysis to be a scientific, validated theory, his own research methodology faces serious problems. From the perspective of contemporary science, it constitutes the most "unscientific" aspect of his whole conception, because it is generally seen as falling victim to the *post hoc ergo propter hoc* fallacy. It is therefore deemed inappropriate for producing any substantial scientific evidence. But – contrary to Popper's prominent critique – it cannot be denied that many claims of psychoanalytic theory are empirically testable and that since the 1950s, a remarkable body of evidence that fulfills scientific research standards has been generated with the aim of confirming the central theoretical claims of psychoanalysis and the efficacy of psychoanalytic therapy. Therefore, in a processual or methodological sense, today's psychoanalysis is without any doubt a scientific research program. But at the same time, it is an open question whether the scientific endeavor to confirm the central claims of psychoanalysis will turn out to be successful. The generally accepted theorems that form the common core of today's psychoanalytic theorizing are – in sharp contrast to Freud's original theory – rather carefully formulated and are not particularly specific. For this reason, the relevance of psychoanalysis for the further development of psychology and medicine and the question of the efficacy and effectiveness of an autonomous psychodynamic therapy are matters of a deep and ongoing controversy.

Introduction

Psychoanalysis is one of the most prominent and intensely discussed research programs of the twentieth century. One important debate in the philosophy of medicine concerns the methodological status of psychoanalysis as a research program. The central question of this debate is the following: is psychoanalysis a scientific research program or does it fail scientific standards? Although there are different theories which are called "psychoanalytic" (not just Sigmund Freud's theory but also Carl G. Jung's theory of archetypes and the collective unconscious, Alfred Adler's individual psychology, Melanie Klein's object relations theory, etc.), the debate concerning the scientific status of psychoanalysis centers primarily around Freud's theory. One historical reason for this is that Freud was the only proponent of psychoanalysis who saw himself as a scientist throughout his whole life and who characterized his theory as a scientific, or at least proto-scientific, project. Furthermore, it was virtually only the Freudian tradition that gave rise to a research program aimed at validating the central claims of psychoanalysis on the basis of scientific evidence and with the help of experimental methods (Hilgard 1952a, b; Kline 1981; Fisher and Greenberg 1996; Chiesa 2010).

The conception of psychoanalysis as a science was challenged primarily by two kinds of criticisms. One line of argument was that Freud fell victim to a "scientistic self-misunderstanding" ("szientistisches Selbstmißverständnis," Habermas 1968; see especially pp. 300–332). Habermas argued that Freud's project is not a branch of the natural sciences but – rightly understood – rather turns out to be a hermeneutics of the self or of consciousness in general. Other adherents of a philosophical reinterpretation of Freud's works localized him within the methodological framework of modern phenomenology and (post-) structuralism (Ricœur 1965). This line of argument is no threat for psychoanalysis as a science if one allows for an "interpretative pluralism" and admits that it is possible to use Freud's theory as a starting point for both a distinct project in the field of the hermeneutical philosophy of consciousness and, at the same time, for a scientific project. Leaving exegetic questions aside, this seems to be an entirely plausible assumption that holds for many theoretical projects (e.g., ancient atomism, which was a theoretical source for both philosophy of nature and modern chemistry). By contrast, the other criticism is far more threatening for the project of psychoanalysis as a science. It is also the origin of the controversy about the scientific status of psychoanalysis. The proponents of this criticism accused Freud of being the founder of a pseudoscience along with astrology, homeopathy, or Marx's historical materialism. They argued that Freud's theory is not a scientific theory, because it is not empirically testable (Karl Popper), that his research methodology is deeply misconstrued (Adolf Grünbaum), and that psychodynamic therapy is at best completely ineffective and at worst dangerous for people suffering from a mental crisis (Hans-Jürgen Eysenck). Defenders of psychoanalysis react to these far-reaching criticisms with certain revisions of the theory or with refutations of the arguments.

This paper reconstructs the core issues, positions, and arguments of this controversy. It takes Freud's theory as a starting point and begins with some remarks about his reasons for classifying his theoretical conception of human mental life as a scientific theory (section "Some Central Claims of Freudian Psychoanalysis"). It then examines further developments of psychoanalytic theorizing (section "Is Freudian Psychoanalytic Theory a Scientific Theory?"), Freudian research methodology (section "Is Freud's Research Methodology a Scientific Methodology?"), and psychodynamic therapy with respect to their scientific status (section "Is Psychodynamic/Psychoanalytic Therapy Scientifically Validated?: A Reflection on Three Stages of Psychotherapy Research"). Due to the absence of a universally accepted definition of the terms "psychoanalytic" and "psychodynamic," both expressions are used interchangeably.

Some Central Claims of Freudian Psychoanalysis

Sigmund Freud was educated in the scientific tradition: he studied medicine, worked in the laboratory of Ernst Brücke on the histology of the nervous system during his studies, collected practical experience as a physician in the areas of

psychiatry and neurology, and acquired a lectureship in neuropathology in 1885. Ten years later he wrote a manuscript, later entitled *Project for a Scientific Psychology* (Entwurf einer Psychologie) by the editors, which opens with the words: "The intention of this project is to furnish us with a psychology which shall be a natural science: its aim, that is, is to represent psychical processes as quantitatively determined states of specifiable material particles and so to make them plain and void of contradictions ([Es ist die] Absicht, eine naturwissenschaftliche Psychologie zu liefern, d. h. psychische Vorgänge darzustellen als quantitativ bestimmte Zustände aufzeigbarer materieller Teile [und sie] damit anschaulich und widerspruchsfrei zu machen)" (Freud 1895, p. 387; the English translations of the quotes from Freud are taken from Strachey, 1966–1974). In this work, he tries to describe mental processes as shifts of quantums of energy within the nervous system. So in the years before 1900, he argued for a reductionist view of psychology as a field of natural science based on neurophysiological knowledge of the nervous system – which is a rather popular view in today's scientific psychology. In the following years he gave up this ambitious project, because he considered the neurophysiology of his time to be in a too rudimentary state of development in order to serve as a fruitful basis for his theoretical ideas. Nevertheless, during his entire lifetime he held the view that the psychoanalytic "hypothesis we have adopted of a psychical apparatus extended in space, expediently put together. . .has put us in a position to establish psychology on foundations similar to those of any other science, such, for instance, as physics ([u]nsere Annahme eines räumlich ausgedehnten, zweckmässig zusammengesetzten . . . psychischen Apparates . . . hat uns in den Stand gesetzt, die Psychologie auf einer ähnlichen Grundlage aufzurichten wie jede andere Naturwissenschaft, z. B. wie die Physik)" (Freud 1940, p. 126), as he wrote toward the end of his life in his work *An Outline of Psychoanalysis* (Abriß der Psychoanalyse).

According to Freud, the systematically conceptualized basic theory structure, the so-called metapsychology, is fundamental for the scientific character of psychoanalysis. The basic principles of his metapsychology are already outlined in his most famous book *The Interpretation of Dreams* (Die Traumdeutung 1900). The core of the theory consists (i) in a topography of the mental apparatus (first explicated as three mental subsystems of the Conscious, the Preconscious, and the Unconscious, subsequently superseded by the second topographic model of Id, Ego, and Superego); (ii) the dynamics of the mental apparatus, consisting of the unobservable mental forces that are causing human behavior (of special importance are the defense mechanisms such as repression, sublimation, and resistance); and (iii) the economic dimension of the mental system, explaining repression and other mental processes as shifts and exchanges of energy quantums between the different subsystems of the mental apparatus, directed from a higher level of "bound" energy to lower energy levels (see for a more detailed description of the general structure of Freud's metapsychology: Kitcher 1992, pp. 39–56). Freud defended the scientific status of the theory primarily with reference to its enormous explanatory power: psychologists, who merely theorize about conscious mental

phenomena, can only provide fragmentary, scattered, and poor explanations of the complexity and diversity of human behavior. By contrast, it is the psychoanalytic assumption of the Unconscious that allows the causes of human actions, motives, and feelings to be explained in a comprehensive and unifying way (Freud 1940, pp. 80–81).

On the basis of this metapsychology, Freud developed more specific theory elements: a theory of personality and psychosexual development, a theory of psychopathology, and a method of psychotherapy, the psychoanalytic, long-term "talking therapy" with a duration of 300, 400, or more treatment sessions. He made an explicit statement about the cornerstones of psychoanalytic theory ("die Grundpfeiler der psychoanalytischen Theorie") in a paper published in 1923: "The assumption of unconscious psychical processes, the acknowledgement of the theory of resistance and repression, the assessment of sexuality and the Oedipus complex are the chief contents of psychoanalysis and the foundations of its theory, and anyone who does not accept them all should not be considered as a psychoanalyst (Die Annahme unbewußter seelischer Vorgänge, die Anerkennung der Lehre vom Widerstand und der Verdrängung, die Einschätzung der Sexualität und des Ödipus-Komplexes sind die Hauptinhalte der Psychoanalyse und die Grundlagen ihrer Theorie, und wer sie nicht alle gutzuheißen vermag, sollte sich nicht zu den Psychoanalytikern zählen)" (Freud 1923, p. 223). These different theory elements – this was one of his central ideas expressed in the quote – are not isolated from another but are deeply interdependent: the basic principles of metapsychology, the more specific theories, and the ideas about effective psychotherapy (compare section "Is Freud's Research Methodology a Scientific Methodology?" below). According to Freud, these elements have to be seen as a holistic framework for human mental life and mental disorder (see for an introduction to psychoanalysis Brenner 1973 and for a detailed account of the whole theory and its reception Köhler 2000).

Patricia Kitcher (1992) deserves credit for having worked out a detailed reconstruction of the embedding of Freud's theory in the research context of the psychiatry, neurology, and neurophysiology of his time. Kitcher convincingly argues that in the light of his historical background, Freud can be seen as the founder of an innovative "complete interdisciplinary science of mind" and his theory as a methodologically subtle and creative reaction to the groundbreaking developments of nineteenth-century neurology, psychiatry, and psychology. But even if this historical thesis is true and if we admit that Freud's theory was a proper part of science in his time, it may nevertheless be the case that psychoanalysis shares the fate of alchemy and astrology, which were branches of science until the sixteenth century, but subsequently became decoupled from the path of scientific progress and are now considered as pseudosciences by most scientists (Newman and Grafton 2001). The next section will investigate the systematic question of whether the further developments of psychoanalytic theory during the twentieth century justify ascribing to it the status of a scientific project in the context of current scientific research.

Is Freudian Psychoanalytic Theory a Scientific Theory?

Karl Popper's Argument Against the Scientific Status of Psychoanalysis

Karl R. Popper, one of the central figures of the philosophy of science in the twentieth century, formulated a far-reaching argument against the possibility of regarding psychoanalysis as a science. His main point was that psychoanalytic theory does not satisfy the demarcation criterion for science. In his book *Logic of Scientific Discovery*, first published as *Logik der Forschung* in German in 1935, he proposed the falsifiability of empirical theories as the decisive demarcation criterion for drawing a line between science and nonscience (Popper 1935). In contrast to the members of the Vienna Circle (e.g., Rudolf Carnap, Moritz Schlick, and Otto Neurath), who developed verificationism as a semantics and methodology for scientific theories, Popper argued that empirical theories are in fact not verifiable, because the method of induction (which is, according to the members of the Vienna Circle, an indispensable inferential tool for the confirmation of empirical theories) faces serious epistemological problems. As an alternative, Popper developed his falsificationism, which, he claims, is exclusively based on deductive inference. According to this view, empirical theories have to be falsifiable, which means it must be possible that the predictions of the theory conflict with observational data. "Every 'good' scientific theory is a prohibition: it forbids certain things to happen. The more a theory forbids the better it is" (Popper 1963, p. 36). Popper notes that already in 1919, when he became acquainted with Alfred Adler, he began to think about the question of what might be wrong with Marx's theory of history, Adler's individual psychology and Freud's psychoanalysis. He found that the problem of all of these theories is that they do not "forbid" anything to happen, i.e., that *every* course of events is compatible with and can be explained by these theories. This explanatory potential makes these theories attractive and suggestive and may also explain their great popularity. But due to their lack of falsifiability, their explanatory success is merely an illusion, because the theories cannot be tested against reality. "A theory which is not refutable by any conceivable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice" (ibid., p. 36). Therefore, according to Popper, psychoanalysis is not a branch of science but a form of psychological metaphysics.

Popper's argument was widely discussed and, in the end, turned out to be unsuccessful, because it faces two serious problems. The first problem lies in Popper's conception of falsifiability itself, which, in contemporary philosophy of science, is almost universally considered as inadequate for demarcating the line between science and nonscience. Popper conceptualizes falsifiability as a two-place relation with one theory in one place and observational evidence in the other. But, as Imre Lakatos convincingly showed, in order to determine the scientific status of a theory, we also have to take into account that scientific theories do not exist in isolation but partake in a scientific discourse along with competing theories and are diachronically embedded in a process of theoretical changes and reformulations. Lakatos developed a more

sophisticated and adequate picture of the falsifiability of theories as a three-place relation between the observational evidence and two (or more) rival theories. Accordingly, falsifiability cannot be ascribed to single theories (as Popper claims for Freud's and Adler's theory) but has to take into account the embedding of a theory in a series of developing theories. Popper fails to take into account that these considerations are of crucial importance for evaluating the scientific status of a research program (Lakatos 1978). Furthermore, Popper's conception is a "single focus" approach to demarcation: he allows one and only one criterion for deciding the question of the theory's scientific status. By contrast, in contemporary philosophy of science, most people believe that the complex question of demarcating science and nonscience can only be answered (if at all) by a multi-criteria approach (Ruse 1982).

But Popper's argument fails for a second, even more serious reason. Popper does not present any case studies or any detailed reconstructions of Freud's theory. Other philosophers of science did so and found that psychoanalysis, e.g., Freud's theory of personality, his etiology of adult obsessional neurosis, and his theory of dreams, does in fact include falsifiable statements – which was already recognized by Freud himself (Grünbaum 1979). Furthermore, even if Popper were partially right and it would turn out that some of Freud's theories are not empirically testable in their existing formulation, it remains possible that they could be reformulated in a more precise way that makes them empirically testable.

Reactions to Popper: Establishing Psychoanalysis as a Scientific Project

During the 1940s and 1950s, several psychologists began working on the project of turning psychoanalysis into a scientific research program by looking for empirical evidence supporting it and by conducting experimental tests of psychoanalytic principles. The first person who coined the expression "psychoanalysis as science" was the Stanford psychologist Ernest R. Hilgard (1904–2001), who published a paper and a book with this title in 1952. His main idea was to collect and evaluate all of the experimental evidence available for psychoanalytic theory and psychoanalytic therapy at that time. His initial conclusions concerning the empirical validation of psychoanalysis (although they were refuted later on; see below) were quite euphoric: "[I]t has been possible to parallel many psychoanalytic phenomena in the laboratory. When this is done, the correspondence between predictions according to psychoanalytic theory and what is found is on the whole very satisfactory" (Hilgard 1952b, p. 42). Just a few years later, Ellis (1956) developed operational definitions of central terms of psychoanalytic theory (such as Id, Ego, Superego, phallic phase, libido, Oedipus complex, etc.) in order to enable a reformulation of the psychoanalytic principles in a way that makes transparent how they can be tied to an observational basis and which observable data confirm and which repudiate their existence. In the following years, the empirical methods became tremendously refined and improved, and a number of monographs were published that presented and collected empirical studies and

conducted meta-analyses in order to test and validate the basic principles of psychoanalysis in a scientific way (Fisher and Greenberg 1977, 1996; Kline 1981). This development culminated in a book series edited by J. M. Masling, systematically collecting the *empirical studies of psychoanalytical theories* (first volume Masling 1983). So now there is in fact a remarkable body of observational and experimental data generated with the aim of proving the truth of the central claims of psychoanalytic theory.

Contemporary Developments

Nevertheless, it would be too hasty to consider psychoanalysis as a generally accepted and well-established field of scientific psychology today. At present, the issue whether psychoanalysis is satisfactorily confirmed with respect to its core concepts and principles or whether it is proven wrong in the end remains unsettled and is still the subject of highly controversial debates. This can be shown, for example, with reference to the controversial assessment of one of Freud's core ideas: in his introduction to a book about the empirical investigation of the neuronal bases of unconscious mental phenomena, James Uleman concludes that indeed the "psychoanalytic unconscious is, to most laypeople and those in the arts and humanities, the only unconscious," but "it does not provide an influential framework for understanding unconscious processes in academic or scientific circles" (Uleman 2005, pp. 4–5). On the other hand, there are approaches for integrating results from psychoanalytic theorizing about unconscious mental phenomena into the context of current scientific research in the neurosciences (Mancia 2006).

These and other highly controversial assessments of the scientific merits of psychoanalytic theory in contemporary discussions in scientific psychology and medicine primarily have two sources. The first is the complex shape and inhomogeneity of the available empirical evidence. At present, certain assumptions of psychoanalytic theory are confirmed by empirical evidence, whereas others are either not sufficiently supported yet or are regarded as refuted – even by contemporary psychoanalysts themselves. The latter holds not only for negligible assumptions but also for some of Freud's most prominent claims: the existence of the Oedipus complex, traditionally seen as one of the core assumptions of his theory of the etiology of neuroses, is only confirmed by rather poor evidence (Kupfersmid 1995). The existence of the death drive, introduced as an antagonistic principle to the libido's "life drive," is currently considered to be clearly refuted in the light of modern evolutionary theory. However, defenders of Freud point out that Freud himself was very uncertain with respect to this element of his theory (introduced by him not until 1917 in rather tentative formulations) and insist that, although the idea of the death drive is wrong, "a number of lessons can be drawn" from it (Black 2011, p. 118). The empirical validation of the existence of repression and resistance, both generally regarded as centerpieces of psychoanalytic theory, is a matter of deep controversy (see the extensive discussion of an article by Erdelyi (2006) in the journal *Behavioral and Brain Sciences*). And finally the ideas of penis envy and

the castration complex as well as the negligence of female psychosexual development are interpreted as a massive gender bias of Freud's theory (Gyler 2010).

At the same time, there are other psychoanalytic claims which are confirmed by empirical evidence and even by systematic experimentation. Westen (1998) has formulated five principles that he considers to be the core assumptions of current psychodynamic theory:

1. "[M]uch of mental life – including thoughts, feelings, and motives – is unconscious."
2. "[M]ental processes, including affective and motivational processes, operate in parallel so that, toward the same person or situation, individuals can have conflicting feelings that motivate them in opposing ways and often lead to compromise solutions."
3. "[S]table personality patterns begin to form in childhood, and childhood experiences play an important role in personality development."
4. "[M]ental representations of the self, others, and relationships guide people's interactions with others and influence the ways they become psychologically symptomatic."
5. "[P]ersonality development involves not only learning to regulate sexual and aggressive feelings but also moving from an immature, socially dependent state to a mature, interdependent one." (Westen 1998, pp. 334–335)

Westen reviews the evidence in favor of these principles and rates all of them as empirically confirmed to a satisfactory degree. He concludes: "Freud advanced several fundamental propositions, once highly controversial and unique to psychoanalysis, that have stood the test of time ... This is probably the best any thinker could hope for in a rapidly developing discipline like ours 60 years after his death" (Westen 1998, p. 362). Of course one should agree with Westen that it would be illegitimate to identify contemporary psychoanalytic theory with Freud's theory and to regard the former as refuted if central claims of the latter are shown to be wrong. But even if it is taken for granted that all of the empirical evidence that Westen refers to is of high methodological quality and therefore entirely convincing, it remains a matter of controversy whether his five principles do in fact capture the essential claims of contemporary psychodynamic theory and if they are specific to it. A closer look at the principles shows that it would be very difficult to find anyone working in contemporary psychology and psychological medicine who questions the truth of principles (4) and (5). Moreover, the other three principles do not seem to be specific to proponents of psychodynamic theory. This holds especially for principle (1), because there are several different conceptions of the Unconscious – as much in current psychology as in the history of the sciences and humanities (see for more details Uleman 2005). In sum, Westen's principles seem to be rather cautiously formulated, and in part they consist in generally accepted psychological assumptions. For this reason, critics of Westen's approach might conclude that it is not too surprising that he is able to offer an attractive number of conclusive empirical evidence for their confirmation.

This discussion leads to the second source of the ongoing controversy regarding the scientific status of psychoanalytic theory. This controversy is not merely a matter of evaluating the quality of empirical evidence alone. Rather, it cannot be solved without answering another crucial question: what is the content specific to current psychoanalytic theory? Which set of assumptions does a proponent of this theory have to accept and which of these assumptions are only accepted by the proponents of the theory? This question cannot be decided on the basis of the available empirical evidence but is related to considerations about the essential theoretical content of the claims of psychoanalytic theorizing. Therefore, this is a highly controversial question even (and especially) between the proponents of psychodynamic theory. What many defenders of psychoanalysis say in favor of their position is that it fell victim to its own success in the sense that some of its claims, historically originating from Freud's theory and empirically well confirmed today, constitute common psychological and medical knowledge, which is accepted by nearly everyone. This might be true. But still the theoretical question remains whether these claims are strong enough to denote a theory core that is specific to psychoanalytic theory (as Westen and others seem to suggest). Only when this question is answered can the controversy about the scientific credibility of psychoanalytic theory be solved.

Is Freud's Research Methodology a Scientific Methodology?

While the scientific status of the content of Freudian theory is currently a matter of controversy, it is widely accepted that the research methodology Freud has introduced as the *via regia* for the empirical validation of psychoanalysis is, from a scientific point of view, the most problematic aspect of psychoanalytic thinking.

Freud himself only used interpretations of individual cases for the empirical confirmation of his theory. In current scientific methodology, this database, especially if used as the only empirical foundation, is generally considered to be poor evidence, because the selection of individual cases is a rather arbitrary process, and the great diversity of phenomena of human behavior and mental life allows for the confirmation of almost any hypothesis by only a small number of cases. Therefore, single case studies are seen as an appropriate heuristic method in theory development and in generating innovative hypotheses, but not as a source of providing evidence for rigorous theory checking.

Freud's way of selecting and interpreting his case studies is also prone to many distortions and biases. Most of the empirical data, cited in his *The Interpretation of Dreams* (1900) with the intention to confirm the basic principles of his metapsychology, are in fact interpretations of the dreams that he himself had during his self-analysis between 1897 and 1899. The other important sources of evidence – especially for the validation of his theory of psychopathology – are detailed analyses of individual patients. Wolpe and Rachman (1960) conducted a reanalysis of his perhaps most famous case study, the first psychoanalysis of a child (published

by Freud in 1909 and entitled *Analysis of a Phobia in a five-year-old boy* (Analyse der Phobie eines fünfjährigen Knaben 1909)). Wolpe and Rachman's central criticism was that the study design violates fundamental standards of scientific objectivity: Freud saw the child only once during the treatment, and moreover, the therapy was conducted by the boy's father, whom Freud himself calls one of his "closest adherents." The emotional relation between the father and son, the partiality of the father with respect to Freud's theory, and the selection effects caused by the communication between the boy's father and Freud are all sources of systematic biases. The most important consequence is that a considerable proportion of the results must therefore be considered as a mere effect of suggestion or indoctrination during the therapy. Without any doubt, a patient in a mental crisis who expects help from the therapist (and in particular a 5-year-old boy in his relationship with his father) is predisposed to be influenced by the suggestions that lead him to accept the "truths" of psychoanalysis during the therapy.

Seven years after the publication of the *Analysis of a Phobia in a five-year-old boy*, in his *Introductory lectures on psychoanalysis* (Vorlesungen zur Einführung in die Psychoanalyse 1916/1917), Freud himself accepted that the problem of suggestion and indoctrination is the most important objection to his research method and he developed a counterargument to refute it. The decisive evidence for the truth of psychoanalytic theory consists, according to Freud, in the unique success of psychoanalytic therapy. This is now recognized, in contrast to, say, hypnosis, which Freud abandoned as a therapeutic method, because he considered it liable to suggestion. Consequently, Freud concluded that only psychoanalytic therapy yields a durable cure. His main argument to establish this conclusion is the so-called tally argument, which he presented in the last lecture of the *Introductory lectures* entitled "The analytic therapy" (Die analytische Therapie). It was reconstructed by Adolf Grünbaum (1984, pp. 135–141). This argument is based on two crucial premises:

1. Only psychoanalytic therapy provides the therapeutic option to not merely remove or shift the symptoms (as with other therapeutic procedures such as hypnosis) but to reveal the hidden (unconscious) causes of the patient's neurosis – even if these causes lie deep in the past of the patient's life.
2. Only this process of disclosure of the true causes of the mental problems to the patients can yield a durable cure from their neuroses (and not merely temporary improvements caused by shifts of certain symptoms and reactions).

From these premises Freud deduced the tally argument's main conclusion: every successful psychoanalytic therapy provides striking evidence for psychoanalytic theory, because the truth of psychoanalytic theory is the only explanation for the exclusive success of psychoanalytic therapy. This conclusion implies that a successful psychoanalytic therapy cannot be contaminated by suggestion or indoctrination. For in that case the therapy would merely remove the symptoms for a time and fail to reveal the true causes of the neurosis. But if the true causes of the neurosis remain unrevealed, no durable cure is possible.

Grünbaum criticizes this argument at length. He argues – against Popper – that his reconstruction of the argument shows the empirical testability of Freud's theory. In fact, there are several assumptions derivable from the tally argument's premises that are empirically testable, namely, (i) the only way to achieve a durable cure of a mental disorder is to reveal its true causes and (ii) psychoanalytic therapy is the only therapeutic method that can reveal a mental disorder's true causes. From (i) and (ii) follows (iii), psychoanalytic therapy alone provides a durable cure, which implies (iv), the occurrence of a spontaneous remission is empirically impossible (compare Freud 1909, p. 339), etc. Grünbaum's main point is that many of these assumptions are either not validated or are simply refuted by the available empirical data (Grünbaum 1984, pp. 141–176).

Even though Grünbaum's reconstruction and critique of the tally argument was criticized concerning certain exegetic respects (Esterton 1996), it is widely agreed that his main point is correct: Freud made the crucial mistake of an inadequate conflation of the empirical validation of causal claims of psychoanalytic theory with the empirical evaluation of the efficacy of psychoanalytic therapy (Greenwood 1996). Even the scientifically orientated psychoanalysts mostly admit that this methodological decision of Freud's is a pitfall for the scientific validation of psychoanalytic theory. The tally argument is usually interpreted as an instance of the *post hoc ergo propter hoc* fallacy, the mistake to derive a causal dependence from a temporal succession of events. This reasoning has certain established applications in medical practice – primarily the so-called *diagnosis ex juvantibus* (diagnosis on the basis of successful treatment). But even this special application is controversial and only admissible under restricted conditions: when the consequence is suddenly perceived after the preceding event and no alternative explanations for its occurrence are available (e.g., in the case of providing treacle in an acute hypoglycemia of a diabetic). None of these conditions are fulfilled in psychoanalysis. For this reason one has to conclude that Freud's research methodology fails to provide any conclusive scientific evidence for either psychoanalytic theory or psychodynamic therapy.

Is Psychodynamic/Psychoanalytic Therapy Scientifically Validated?: A Reflection on Three Stages of Psychotherapy Research

One lesson of the last section is that the areas of psychodynamic theory and psychodynamic therapy are considerably more independent from each other than Freud himself thought. This can be seen as good news for the project of the scientific validation of the methods of psychoanalytic therapy. The reason is that even if it turns out to be the case that the central claims of psychoanalytic theory have to be abandoned, psychoanalytic therapy might still be an effective method for the treatment of mental disorders. So the question about empirical evidence for the efficacy and effectiveness of psychoanalytic therapy arises.

First Stage: Clinical Studies and First Meta-Analyses

The progress of empirical research that has been carried out in order to confirm the efficacy and effectiveness of psychoanalytic therapy can be structured in three chronological stages. The first stage, beginning around the year 1950, is characterized by the first comparative experimental testing of different types of psychotherapy and by the attempt to integrate the results of these quite divergent clinical studies into several meta-analyses. In this early stage of psychotherapy research, most of the meta-analyses resulted in one of the following two results. A prominent example for the first result is the research of the psychologist Hans-Jürgen Eysenck, an influential theoretician of intelligence factor theory and defender of behavioral therapy. He conducted an oft-quoted meta-analysis of 24 effectiveness studies of psychotherapy and concluded that the recovery rate of neurotic patients after undergoing a psychoanalytic therapy is not higher than the rate of spontaneous remissions – in his own, somewhat polemic words: "[W]hen we discount the risk the patient runs of stopping treatment altogether, his chances of improvement under psychoanalysis are … slightly worse than his chances under a general practitioner or custodial treatment" (Eysenck 1952, p. 322). The second result, which is not necessarily contradicting Eysenck's verdict and can be found in many meta-analyses of that time, confirms the so-called dodo bird conjecture, named after the dodo bird in Lewis Caroll's *Alice in Wonderland* and its aphorism: "Everybody has won, and all must have prizes." The conjecture says that all types of psychotherapy (psychoanalytic therapy, behavioral therapy, and eclectic approaches) in the end show more or less equivalent outcomes – and if one type of therapy is shown to be superior in a given study, the result usually conforms with the preferences of the investigators (Luborsky et al. 1975). Sometimes this result is interpreted as a methodological artifact: most studies of that time did not reliably distinguish between different mental disorders. It could be that every type of therapy is effective only for some disorders and that the averaging evaluation of therapeutic success over all disorders merely levels out these differences. As a consequence, some psychoanalytically orientated psychotherapists recommended behavioral therapy for minor mental problems and psychodynamic therapy for the treatment of severe mental disorders (Pongratz 1973, p. 378). But there was no empirical evidence for this disorder-specific indication schema (and the current evidence seems to refute it, as shown below). From the present perspective, many of the clinical studies in that stage of research have to be criticized for their methodological deficiencies (subjective or obsolete diagnoses of the investigated mental disorders, unreliable measures of therapeutic success, failures in the statistical evaluations, selection biases in the meta-analyses), which undermine the credibility of the results.

Second Stage: Large-Scale Meta-Analyses

The second stage of psychotherapy research is characterized by the effort to overcome these methodological shortcomings with the help of more sophisticated

statistical methods and larger samples of investigated subjects. During the 1980s, Grawe et al. (1994) began to plan and undertake one of these large-scale meta-analyses, which indicated a substantial advance in psychotherapy research. First, they conducted a careful survey of the entire available research literature including all clinical studies ever carried out for the evaluation of psychotherapy – from the beginning of psychotherapy research until 1983/1984. Initially, they found more than 3500 studies. After a criteria-based selection process, 897 of these studies were found to fulfill satisfactory methodological standards. (This means that Grawe et al. included nearly twice as many clinical studies as Smith et al. (1980), a far more influential meta-analysis in the English-speaking literature that includes 475 studies.) These 897 studies served as the data basis for their systematic comparative meta-analysis of more than 40 therapeutic techniques, sorted into three broad therapy types: humanistic therapies, cognitive-behavioral therapies, and psychodynamic therapies. In the area of psychodynamic therapy, they distinguished between nine different therapeutic methods, including classic long-term psychoanalysis, psychoanalytic short-term therapy, Adler's individual therapy, and Binswanger's "Daseinsanalyse." The scientifically best-evaluated methods were the psychoanalytic short-term therapy (29 studies) and psychodynamic therapy combined with medical treatment (13 studies). For the remaining 7 psychodynamic therapies, Grawe et al. found that only 28 studies fitted their criteria. So overall, until 1983, there were merely 70 studies that assessed the efficacy of psychodynamically orientated psychotherapies. By comparison, at the same time there were 452 studies that evaluated the efficacy of the different methods of cognitive-behavioral therapy. Another indicator for the relatively small effort to prove the efficacy of psychodynamic therapy is the fact that Grawe et al. did not find a single study that fulfilled their selection criteria and evaluated classic long-term psychoanalysis, favored by Freud himself. The only systematic and controlled study to evaluate long-term psychoanalysis is the famous and oft-quoted study of the Menninger foundation, which was initiated in 1954 and lasted for more than 20 years. The study was conducted by some of the most prominent psychoanalysts of that time (Otto Kernberg, Robert Wallerstein, Merton Gill, and others) and included 42 patients, all of them suffering from severe neuroses. One reason for the long duration of the study was the average duration of psychoanalytic treatment (of the 15 patients who finished the therapy) of almost 6 years; during this time each patient received 1017 treatments on average. It is a remarkable result that even in this extremely extensive study, undertaken by renowned psychoanalysts, it was in the end not possible to show that the long-term success of psychoanalysis is superior to an alternative psychotherapy with only one third of the treatment sessions (Wallerstein 1986, p. 515).

Grawe et al. (1994) did not include the Menninger study in their meta-analysis due to its methodological shortcomings, but they also conducted a direct comparison between the efficacy of the psychodynamic therapy type on the one hand and the two types of cognitive-behavioral therapy and humanistic therapy on the other hand. They selected the comparative studies and found that, in general, cognitive-

behavioral therapy is significantly more effective than both psychodynamic therapies and humanistic therapies. A statistical effect size comparison of the 22 studies (with a total of 487 patients), which included a direct comparison, showed an averaged effect size of 0.83 for psychoanalytic psychotherapy and an averaged effect size of 1.23 for cognitive-behavioral therapy. Significance testing of this difference with the *t*-test for dependent samples showed that the difference is highly significant ($p < 0.0001$). Grawe et al. (1994, pp. 651–671) interpreted this result as strong evidence for both (i) the efficacy of psychodynamic therapy and also (ii) for the superiority of cognitive-behavioral therapy over the different methods of psychodynamic therapy.

Of course, Grawe and his colleagues' results provoked much criticism, especially from defenders of psychoanalytic therapy. Tschuschke et al. (1998) conducted a reanalysis of the 22 comparative studies from Grawe's meta-analysis. They undertook a systematized rating process by 12 independent psychotherapy researchers in order to evaluate the methodological quality of the studies. This expert rating showed the result that "only 5 or 8 of the 22 studies, respectively, could be accepted for a relatively fair comparison between the treatments under study" (Tschuschke et al. 1998, p. 430). They found all other studies to be either methodologically deficient or systematically biased. Surely, expert ratings have their own problems concerning the impartiality of and the criteria for the selection of the experts. But one systematic problem of many meta-analyses cannot be denied – regardless of how comprehensive their data base may be: the therapeutic interventions that are investigated in the multitude of the included studies (even if they are all summed up under the label of "psychodynamic therapy" or "psychoanalytic therapy") diverge considerably with respect to the dosage and realization of the treatment, the competence and practical experience of the therapist, and the duration of the therapy.

Third Stage: Comparative Psychotherapy Process-Outcome Research

In order to solve this methodological problem, which undoubtedly undermines the interpretability of the results, the third and current stage of psychotherapy research emerged, the so-called comparative psychotherapy process-outcome research. The aim of this branch of research is to empirically examine what exactly happens in the psychotherapeutic process, what the essential features of a certain method of psychotherapy are, and in which respect the properties of different methods and interventional practices diverge. Blagys and Hilsenroth (2000) conducted a study in order to isolate features that distinguish between cognitive-behavioral therapy on the one hand and psychodynamic-interpersonal therapy on the other. They did not only evaluate the theoretical literature on therapy but also generated a database in order to reveal information about the empirically perceived therapeutic processes that characterize the interventions usually labeled as psychoanalytic or psychodynamic therapy. They found seven features that reliably characterize the

empirical practice of psychodynamic therapy in contrast to the methods of cognitive-behavioral therapy:

1. A "focus on affect and the expression of patients' emotions"
2. An "exploration of patients' attempts to avoid topics or to engage in activities that hinder the progress of therapy"
3. The "identification of patterns in patients' actions, thoughts, feelings, experiences, and relationships"
4. An "emphasis on past experiences"
5. A "focus on a patients' interpersonal experiences"
6. An "emphasis on the therapeutic relationship"
7. An "exploration of patients' wishes, dreams, or fantasies" (Blagys and Hilsenroth 2000, pp. 169–182)

On the basis of these criteria, it might become possible to define the core elements of psychodynamic treatment and to make clear comparisons between different therapy methods in order to isolate the most effective techniques. "In addition, future research on the relationship between process and outcome can aid in the determination of when and with whom the use of these techniques will be most effective" (Blagys and Hilsenroth 2000, p. 185). This project seems very promising, but it is in an early stage of its development. Presently there are no definite results concerning the efficacy of psychodynamic therapy on the basis of empirically validated process-outcome criteria that would be required for the project.

To sum up, the area of psychotherapy features a research situation that is similar to the stage of the empirical validation of the principles of psychodynamic theory (compare section "Contemporary Developments"). Again, one could question whether claims like Blagys and Hilsenroth's (2000) are strong enough to define a core of methods that can serve as the basis of an autonomous therapy method. Whereas some researchers work on the further development and validation of a specific psychodynamic psychotherapy (Shedler 2010), others regard this project as "confessional" and instead favor the strategy of integrating the most successful interventions from different therapy methods into a unified "professional" psychological psychotherapy (Grawe 1998). But there is no agreement on this matter. There is a great variety of diverging definitions and approaches in today's research on the efficacy of psychotherapy in general and psychodynamic therapy in particular (Levy and Ablon 2009).

Conclusion

This chapter has addressed the question of whether psychoanalysis is a science. Even if Freud himself thought of psychoanalysis as a scientific project, his own methodological conception of the validation of his theory faces serious problems, and given today's scientific standards, it probably has to be considered as the most

"unscientific" aspect of his whole conception. His idea to construe the research methodology of psychoanalysis as deeply intertwined with its therapeutic methodology and his claim that therapeutic success is the most important validation for psychoanalytic theory are instances of the *post hoc ergo propter hoc* fallacy and therefore inappropriate for producing any substantial scientific evidence for psychoanalysis.

However, contrary to Popper's critique, it cannot be denied that many claims of the Freudian theory are empirically testable and that since the 1950s, a remarkable body of evidence that fulfills scientific research standards has been generated with the aim of proving the truth of psychoanalytic theory and of evaluating the efficacy of psychoanalytic therapy.

Nevertheless, in contemporary scientific medicine and psychology, it is highly controversial whether – and if so, to which degree – the attempt to confirm the central claims of psychoanalysis with scientific research methods will turn out to be successful. Again, Lakatos' terminology is helpful in order to adequately describe the state of the current discussions of the question about the scientific status of psychoanalysis. In his theory of research programs, Lakatos differentiates between the "hard core" of a research program, which is formed by the axioms, basic principles, and central theorems of the theory and its "protective belt," consisting of more specialized theory elements, paradigmatic heuristics and methods of experimental and observational research, ad hoc hypotheses, etc. (Lakatos 1978, pp. 47–90). Applying this terminology to psychoanalysis, its development during the twentieth century can be described as follows: in Freud's times, psychoanalysis was characterized by an ambitious "hard core" (complex and far-reaching theoretical principles formulated in Freud's extensive writings), but it lacked any substantial scientific validation. The observational and experimental research that has been carried out since the 1950s equipped psychoanalysis with a remarkable "protective belt" and turned it into an influential and well-known research paradigm in psychology, psychiatry, and clinical medicine. In this processual or methodological sense, today's psychoanalysis is a scientific research program. But at the same time, this process led to a significant thinning of the "hard core" of both the content of psychoanalytic theory and the methodology of psychodynamic therapy. The generally accepted theorems that form the common core of psychoanalytic theorizing today are rather cautiously formulated and are not particularly specific. For this reason, the progressiveness of this research program, its relevance for the further development of current psychology, and the philosophy of consciousness as well as the question of the efficacy and effectiveness of an autonomous psychoanalytic therapy remain highly controversial.

Definition of Key Terms

Unconscious	A core concept of Freud's theory, introduced as an element of Freud's first topographic model of the mental apparatus, structuring the mind into three parts: the Conscious, the

	Preconscious, and the Unconscious. Freud was convinced that every instance of human behavior, motive, or feeling must have a mental cause. He regarded the Unconscious as the source of all of the "hidden" causes that have to be assumed as the basis of a comprehensive and unified explanation of any phenomena of human mental life.
Repression	A core concept of Freud's theory, introduced in order to describe the dynamics of human mental life. Mental content that is felt to be too awkward, displeasing, or painful to cope with is repressed in the Unconscious. These mental contents cause various mental phenomena (e.g., dreams or neurotic symptoms) that represent the repressed content in a deformed way to the Conscious.
Significance level	Statistical measure to specify the probability that a certain property, effect, or group difference measured in the study sample also exists in the overall population. A significance level of 5 % ($p = 0.05$) indicates that the investigated condition measured in the sample is also present in the overall population with a probability of 95 %. In other words, a probability of 5 % indicates that the study results do not represent a condition of the population but are merely due to a sampling error.
Effect size	Statistical measure to quantify the size or magnitude of a measured effect. This statistical measure is particularly relevant in psychotherapy outcome research, because the focus here is not only to show that the investigated treatment has an effect but also to show the magnitude of the effects. Significance levels are not helpful in this respect, because they do not contain any direct information about the magnitude of the measured effects or conditions. A metric that is often used for determining effect sizes is normalized with reference to standard deviations. So if an effect size of 1 is reported in order to quantify the success of a therapy, this means that the comparison between the average health status of the patients before and after the therapy showed a gain of one standard deviation.
Randomized controlled trial (RCT)	Study type which is currently regarded as the methodological "gold standard" in (clinical) psychology and medicine. In this field, RCTs are primarily used to conduct fair checks of the effectiveness and efficacy of innovative treatments. RCTs contain at least two subsamples, a treatment group, and one or more control groups. The treatment group receives the treatment under investigation, and the control group(s) receives either an alternative treatment or a placebo. The assignment of the participants to the different

	groups is carried out randomly as a statistical means for controlling the influence of distorting effects that are unknown to the researchers.
Meta-analysis	Complex statistical procedure for integrating the results of a multitude of single studies. The aim is to strengthen the validity of the results by considering as much information as possible, avoiding the effects of one-sidedness and balancing the methodological limitations of individual studies. The main problem of meta-analyses is the diversity of the included studies, which is a challenge for the applied statistical methods and may affect the interpretability of the results.
Post hoc ergo propter hoc fallacy	The fallacy to derive conclusions about causal dependencies from the mere temporal succession of events.

Summary Points

- Although there are different theories which are called "psychoanalytic" (not just Sigmund Freud's theory but also Carl G. Jung's theory of archetypes and the collective unconscious, Alfred Adler's individual psychology, Melanie Klein's object relations theory, etc.), the debate concerning the scientific status of psychoanalysis centers primarily around psychoanalytic theorizing in the Freudian tradition.
- The controversy about the scientific status of Freudian theory originated primarily from the fundamental criticism that psychoanalysis is a pseudoscience, along with astrology, homeopathy, or Marx's historical materialism.
- In order to provide an elaborate answer to the question to which extent the project of validating psychoanalysis with scientific methods is judged to be successful in contemporary science, it is necessary to differentiate between psychoanalytic theory, psychodynamic therapy, and the research methodology applied in the Freudian tradition.
- It is widely accepted that the research methodology Freud has introduced as the *via regia* for the empirical validation of psychoanalysis is, from a scientific point of view, the most problematic aspect of psychoanalytic thinking. It is generally seen as an instance of the *post hoc ergo propter hoc* fallacy and therefore as inappropriate for producing any substantial scientific evidence.
- However, since the 1950s, a remarkable body of evidence that fulfills scientific research standards has been generated with the aim of proving the central theoretical claims of psychoanalysis and the efficacy of psychoanalytic/psychodynamic therapy.
- The scientifically validated theorems that form the common core of today's psychoanalytic theory are – in sharp contrast to Freud's original theory – rather carefully formulated. It is generally seen as an open question whether these claims are strong enough to denote a theory core that is specific to psychoanalytic theory.

- The area of psychotherapy features a research situation that is similar to the stage of the empirical validation of psychoanalytic theory. Again, one could question whether the essential claims of current psychodynamic therapy are strong enough to define a core of methods that can serve as the basis of an autonomous therapy method.
- The progressiveness of psychoanalysis as a scientific research program, its relevance for the further development of current psychology and medicine, and the question of the efficacy and effectiveness of an autonomous psychoanalytic therapy remain highly controversial.

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