

Drug dependence as a split object: Trajectories of neuroscientification and behavioralization at the Max Planck Institute of Psychiatry

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ABSTRACT

Today, drug dependence is often understood as a “brain disease” and as an indication for behavioral therapy. In this article, I trace the historical development of the notions of drug dependence as a neuronal and behavioral problem in the local research context of the Max Planck Institute of Psychiatry in Munich, Germany. Focusing on the period from the 1950s to the 1980s, I argue that the neuroscientific and behaviorist understanding of “dependence” had two different trajectories that were yoked together under the same institution of self-proclaimed basic research: (a) the neuroscientific notion derived from an older toxicological approach to drug effects that was then accompanied by biochemical methods from the 1950s onwards, and neurochemical approaches from the 1960s and 1970s; and (b) the behaviorist notion had predecessors in psychotherapeutic approaches to addiction that emerged in the 1950s and took a psychodynamic orientation at the Institute. When the Institute positioned itself as a basic research establishment and developed a unified structure during the 1960s, these psychodynamic approaches were excluded for being “too applied.” Soon afterward, behaviorist psychotherapeutic approaches to drug dependence emerged in the 1970s, emphasizing their foundation in basic research. Even though neuroscientific and behaviorist notions had some overlaps through the use of animal experimentation and by referring to basic research, researchers using the two approaches remained separate in their respective units during the time period under analysis. When conceptualizing the local scientific occupation with “drug dependence,” I apply here the history of science concept of a “split object.” Like the “boundary object,” the split object is plastic enough to adapt to local conditions and robust enough to maintain its genuine identity. Compared with the boundary object, however, the split object does not invite scientific collaboration. It does, nonetheless, enable epistemic coexistence under a common institutional goal.

KEYWORDS

Addiction research; history of behaviorism; history of drug dependence; history of neurosciences; history of psychotherapy; neurophysiology; neurochemistry

Introduction: Brain disease and behavioral disorder

According to a leading German textbook on the treatment of drug dependence (Täschner et al. 2010, 59, 61, 123), it can be seen as “a disease of the brain” in which the neurotransmitter dopamine acts as a form of “behavioral reinforcement” that is best treated with

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“behavior therapy.” One of the editors of the textbook was the influential German addiction therapist Gerhard Bühringer, who began his career at the Max Planck Institute of Psychiatry (MPIP) in Munich. The description of drug dependence—or drug addiction, another common term—as a neuronal disorder and at the same time as a field of application for behavior therapy (or cognitive-behavioral approaches) can be seen as typical for the German-speaking context today; it dominates textbooks, scientific discourses, and practices. Yet how did the ontological concept of addiction as a brain disease and behavioral problem emerge in the German-speaking world? And what role did the MPIP play in this epistemic context?

I will address these questions by focusing on developments in German addiction research during the decades following World War II. Focusing on the research institute of the MPIP, I will examine one of the most high-ranking institutions of scientific psychiatry in Germany, where the study of addiction has long played a major role. In this way, I want to show that central concepts and therapy practices were developed during the period that led to a “neuroscientification” and “behavioralization” of addiction. Thereby, neuroscientification refers to the assumption of a neuronal, brain-centered ontology of addiction and its integration into neuroscientific (as distinct from purely neurological) discourses and practices. By behavioralization, I mean the adoption of the concept in behavioral psychology or psychotherapy.

In the history of medicine and in science studies, there are already several works on addiction, substance abuse, and drugs (e.g., Campbell 2007; Oram 2018; Porter and Teich 1995). Some historical analyses have shown that the neuroscientific notion of “addiction as brain disease” dominant today became more widespread in the 1990s (Campbell 2019; Rose 2003; Satel and Lilienfeld 2014). As part of this development, an article titled, “Addiction Is a Brain Disease, and It Matters,” was particularly influential at an international level. It was published in 1997 by the former director of the American National Institute on Drug Abuse in the journal *Science* (Leshner 1997). However, some studies in the history of science concept of show that brain-centered models of drug dependence had early precursors during the period after World War II; these often emerged in proximity to behavioral approaches (Campbell 2019). Most of the existing historiography focuses on trajectories in English-speaking countries. In contrast, research into the history of drugs and addiction in the German-speaking context often concentrates either on the nineteenth and early-twentieth centuries or on aspects of cultural history (e.g., Feustel, Schmidt-Semisch, & Bröckling 2019). The role of the Max Planck Society (MPS)—one of the largest and most influential research societies in German-speaking countries—and of individual institutes such as the MPIP have been largely neglected. The topic of this article thus hovers over a research desideratum.

In my analysis, I will look at the historical precursors of the recent notion of drug dependence as a brain disease and a behavioral problem that proliferated from the 1990s onward. For this purpose, the primary focus will be on the period before the 1990s, ranging from the 1950s to the 1980s, as it was during this period that addiction as a behavioral and neuroscientific object began to emerge. This is reflected in the institution under examination. At the MPIP, research on drugs and addiction expanded considerably during this time, and many new departments were created (on the organization of the individual departments at the MPIP in 1983; see Figure 1). Looking at the various approaches to drugs and addiction at the Institute, my study is based on three different

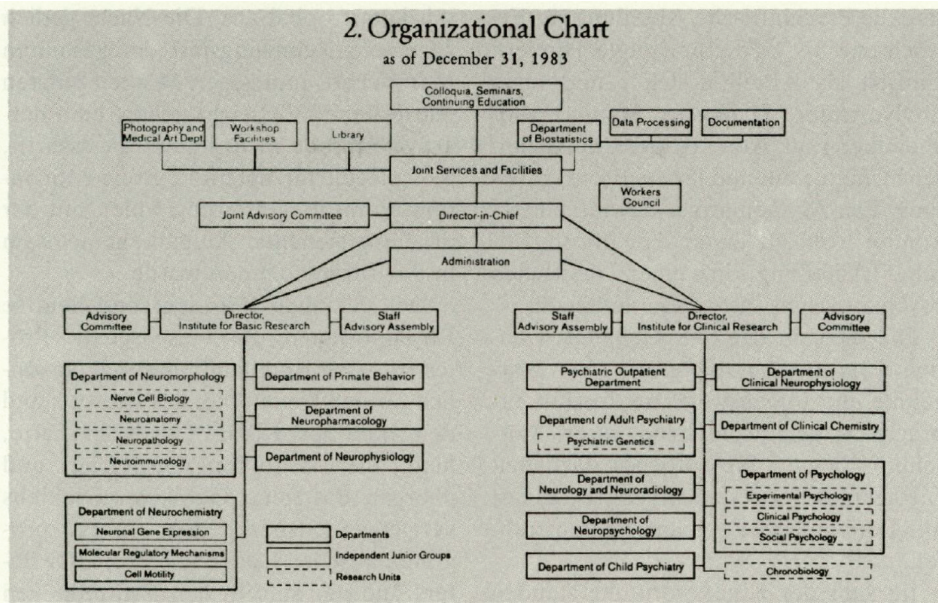


Figure 1. Organization of the individual departments of the MPIP, 1983.
(Source: Max-Planck-Gesellschaft, 1992, 47).

types of sources. First, it offers an analysis of the Institute's scientific publications. To obtain an overview of dominant research programs, I examined the Institute's annual reports—published literature lists and project summaries—for the topics of psychoactive substances, addiction, and drug dependence. I then analyzed 17 of the relevant specialist publications in more detail. Second, I performed a contextual investigation. To obtain more background information on motivations and institutional structures, I used archival materials kindly provided by the Research Program on the History of the Max Planck Society. These included personal files, correspondence, and minutes of meetings. Third, in order to examine interpersonal experiences and communications, I also used interviews with eyewitnesses as a circumstantial historical source.

This article will consider the phenomenon of drug dependence as a heterogeneous and flexible object of knowledge that is stabilized in a specific form in material and epistemic practices as well as academic and professional networks. To answer the initial questions about what role the MPIP played in reifying the object of addiction as a brain disease and behavioral problem in the German-speaking scientific and clinical context, I will proceed as follows: First, the historical and social context of “drug dependence” as a research object will be established. For this purpose, I describe the history of drug addiction and the institutional development of the MPIP. Following that, I focus on the development of the research object of “dependence” at the MPIP by examining both the biochemical and psychotherapeutic approaches to drug dependence there. In the 1960s, the Institute came to focus explicitly on “basic research,” while excluding psychodynamic psychotherapy and instead returning to biological psychiatry. It was precisely during this phase of expansion and reconstruction in the 1960s that research on drug dependence intensified. Against

this backdrop, drug dependence emerged as an onto-epistemic object at the Institute across different departmental and disciplinary boundaries. In describing these historical developments, I will also provide some theoretical context pertaining to the specific configuration of addiction/dependence as an object of research in the way it was formed at the institute.

In research carried out in the field of science and technology studies (STS), a great deal of focus has been placed on cooperation and collaboration—for, example in regard to “trading zones” (Galison 1997; Porter and Stahnisch 2015) or common research “repertoires” (Ankeny and Leonelli 2016). Against this background, comprehensive theories on epistemic objects that enable collaboration are effective across disciplinary boundaries and form parts of multiple social worlds that have already been presented. Particularly pertinent in this respect is the idea of the “boundary object” by Leigh Star and Griesemer (1989) that Löwy (1992) expanded into the “boundary concept.” Both approaches refer to objects that are open enough to allow heterogeneous definitions and methods, but at the same time are stable enough to preserve their identity and enable cooperation between different research groups and social worlds.

In my own historical research, I initially looked at the object of dependence at the MPIP through the lens of the boundary object. However, in the research process, it turned out that the departments worked largely isolated from one another, and very little exchange or cooperation took place. This finding may not be surprising: In scientific institutions, different research groups often coexist without being in conflict, competition, or cooperation with one another. In order to theorize such institutional coexistence, I argue that drug dependence was initially established at the Institute as a so-called “split object.” With split object, I am referring to such research objects that, like the boundary object, are “both adaptable to different viewpoints and robust enough to maintain identity among them” (Star and Griesemer 1989, 387). However, in contrast to the boundary object, split objects were not used for the purposes of cooperation. Instead, they allowed multiple versions of the object, and at the same time enabled the coexistence of these versions without conflicting with established institutional contexts. At the MPIP, the object of dependence provided many starting points for heterogeneous scientific projects that had to unite under the term, “basic research.” This led to the parallel development of neurochemical and behavioral frameworks.

Background: Addiction, dependence, and drugs in Germany

The history of the modern concepts of addiction and drugs began at the end of the nineteenth century, when new drugs entered the market as medications or as means of leisure and recreation. These drugs included cocaine, which was widely used as a medication in the second half of the nineteenth century, and heroin, introduced in 1898 by the German company Bayer (Pieper 2002, 12–13). When it became clear that many individuals were using these substances regularly and in increasingly frequent doses, a rising number of physicians began to address such phenomena using the label of “addiction,” and diagnoses such as opium addiction, alcoholism, and cocaineism emerged (Tanner 2019a). Narcotics were finally prohibited in many Western countries like the United States and Germany at the beginning of the twentieth century. At the same time, the medical discourse increasingly shifted toward abstinence movements and eugenic ideas (Ledebur 2011, 164–167; Stahnisch 2014).

Political und medical debates became increasingly concerned with the dangers of addiction, which led to new attempts at treatment in Germany. Especially during the 1920s, German public officials created so-called “abstinence sanatoriums” for alcoholics and morphine users. In these sanatoriums, it became common practice that patients stayed for long periods in closed-off detoxification and withdrawal centers because people classified as addicts were becoming known for a tendency to relapse (Ledebur 2011, 261–281). During the period when the National Socialists were in power in Germany, the situation for patients deteriorated severely. The Law for the Prevention of Hereditarily Diseased Offspring (*Gesetz zur Verhütung erbkranken Nachwuchses*), passed on July 14, 1933, included the forced sterilization of alcoholics and, beginning in 1933, sanctions for the habitual use of illegal narcotics, including compulsory admission to a mental hospital or sanatorium for an indefinite period up to several years (Haverkamp 2012, 45).

At the same time, during National Socialism there was an increase in legal drug use. In 1936, the German Temmler-Werke began producing Pervitin®, which became a widely consumed drug based on the stimulating substance methamphetamine (Baader 1990; Ohler 2019). The drug was used by millions of German *Wehrmacht* soldiers during World War II (Ohler 2019). The production and use of Pervitin® occurred in conjunction with a general international psychopharmacological interest in amphetamine in that period, which “may be regarded not only as the first mass-marketed psychoactive drug but also as the first drug whose psychoactive and therapeutic effects could be framed in the context of a neurobiological theory of mental functions” (Badiani 2015, 758). In the postwar period, addiction remained an issue in German society. This included older substances such as alcohol and cocaine, but also the newer amphetamines. The latter included Pervitin®, as many war veterans had received the substance without knowing about the risks and the drug had remained legally available in West Germany until 1988.

Although one can certainly find evidence of various “drug waves” in the history of addiction, the term was not coined until the 1960s, when anxieties about drug abuse escalated. The first officially perceived drug wave hit West Germany at the time of the student movement, which expressed a fundamental criticism of society and protested against capitalist economic structures. Revolution was the name of the game, in society and in many peoples’ heads. For a large part of the student movement, this also included experimenting with drugs, mainly as an influence of the American hippie counterculture, which was widely adopted by many young people in Germany (Tanner 2019a). Initially, these youth cultures and protest movements considered hashish and lysergic acid diethylamide (LSD) to be the most revolutionary and politically relevant drugs (Amendt 2008; Dyck 2008; Oram 2018). In West Berlin, for example, there was a radical left-wing group called the Central Council of Roving Hash Rebels (Siegfried 2018, 36–37). At the beginning of the 1970s, people from outside the political scene also increasingly consumed drugs of this kind; hashish and psychedelic drugs became popular in contemporary youth culture (Siegfried 2018). But in Germany, as in the United States and many other Western countries, a much harder drug soon began to spread. Heroin consumption led to an increased number of deaths in drug users. A sense of alarm grew among German politicians and the press that often came to adopt a demonizing rhetoric similar to that of U.S. President Richard Nixon (1913–1994), who, in 1972, proclaimed drugs “public enemy

no. 1” and declared a “war on drugs” (Chapman 2015, 703). Warnings were now voiced throughout West Germany about a drug wave, which sometimes also served to project the fear of alternative lifestyles prevalent within the youth culture.

All the discussion taking place about the perceived threat of drug waves soon prompted legal changes. In December 1971, the West German government announced the Narcotic Drugs Act (*Betäubungsmittelgesetz*), which made multiple aspects of drug use illegal and imposed legal restrictions and harsher prison sentences (Bundesministerium der Justiz 1972). As a result of the tightening of the law, the number of narcotics offenses being processed by the legal system increased massively. Whereas in 1969 there were 4,405 offenses in West Germany, by 1979 the figure had risen to 47,258 (Bundeskriminalamt 1980, 150).

Some years earlier, international experts and the competent authorities had changed diagnostic categories regarding addiction and drug use. In the German health system, the International Classification of Disease (ICD) published by the World Health Organization (WHO) was and is the central diagnostic tool, used for insurance coding purposes. In 1957, the WHO introduced the word “addiction” (*Sucht*) as the official term employed in the ICD.¹

In 1964, the ICD was further revised, addiction being replaced by drug “dependence” (*Abhängigkeit*). With this new term, WHO officials wanted to destigmatize the concept of addiction, with its negative connotations (Marion and Oliver 2014, 249). Additionally, psychological and social side effects or consequences were also to be included by this terminology. Officials also added “abuse” as a category in the ICD, which allowed for alcohol or drug consumption to be classified below the threshold of dependence. Based on the changes in the ICD, the German Federal Social Court ruled in 1968 that dependence was a condition requiring hospital care. In this way, there were now more options to diagnose and treat the use of alcohol or illegal substances (such as LSD or marijuana). As such, the modified legal and diagnostic classifications considerably increased the number of persons who qualified for treatment. Within this context—a heated political atmosphere and an expanded field of medical competence—research on drug addiction at the MPIP in Munich diversified. But what kind of institute was it that now turned toward this topic?

Background: The German Research Institute of Psychiatry and the MPIP

The MPIP has a long history, being founded by the psychiatrist Emil Kraepelin (1856–1926) as the German Research Institute of Psychiatry (*Deutsche Forschungsanstalt für Psychiatrie*—DFA) in Munich in 1917. The institution was incorporated into the Kaiser Wilhelm Society in 1924 (Weber 1991). Since its foundation, it has accommodated various contemporary approaches to biological psychiatry, from chemical-serological analyses to pathological-anatomical examinations of the brain and eugenic approaches (Max-Planck-Gesellschaft 1983, 12–14). This last approach became increasingly dominant, particularly during National Socialism (Roelcke 2002), and it had an impact on brain research (Schweizer-Martinschek 2004).

¹In 1957, the official diagnostic term in the ICD was “addiction” (WHO, 1957). In the text, however, the term “dependence” was often used as a synonym until it finally replaced addiction as an umbrella term in 1964. Although the ICD is the central manual for the European context, the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* is more important in North America. In the *DSM*, the development of the category was different, with the term “substance use disorder” dominating (Shorter 2005). Moreover, “addiction” is still used more widely in the English-speaking world.

Addiction and psychoactive substances are lines of research that date back to the DFA's early years. At the institute, this research was characterized by two different approaches: a toxicological approach, which focused primarily on the direct effects of substances and thus neglected long-term developments such as addiction; and an initial eugenic approach, which framed addiction more generally as a degenerative disorder.

The first approach is attributed to Emil Kraepelin (1856–1926), the director of the Institute, who promoted research on the toxicological effects of alcohol, cocaine, scopolamine, and morphine in the 1920s (Max-Planck-Gesellschaft 1960). One of the aims of this research was to gain a better understanding of mental disorders. Kraepelin assumed that exogenous damage caused by substances like alcohol or morphine would lead to clinical conditions similar to the alleged “endogenous” psychopathologies and therefore suspected a possible “self-poisoning” of the organism in certain mental disorders (Tornay 2016, 65). The effect of intoxicating substances thus served as a model, a kind of “insanity in miniature,” that could provide general information on the biological foundations of psychiatric diseases, especially psychosis (Tornay 2016, 70).

The second, eugenic approach considered addiction as hereditary and a danger to the “body of the people” (*Volkskörper*). Many DFA researchers advocated this approach, which was also in keeping with contemporary psychiatric views. However, it was particularly dominant in the Genealogical and Demographic Department of the DFA under Ernst Rüdin (1874–1952), who served as scientific advisor for the National Socialist Law for the Prevention of Hereditarily Diseased Offspring implemented in 1933 (Gütt, Rüdin, and Ruttke 1934).

During World War II, the DFA became more influential due to Ernst Rüdin's dominant role (Schmuhl 2016). Its budget was even increased in 1943 and 1944 during the last two years of the war (Hachtmann 2007, 1276–1278). By the war's end, the research institute's main building had been destroyed, financial resources were scarce, and a large part of the staff had disappeared (Weber 1992, 33–35). Beds for clinical research on patients, which had been provided by the adjacent Schwabing City Hospital since 1922, were no longer available because of the destruction caused by war and the reappropriation of several wards for army purposes. Consequently, the planned reconstruction of the DFA in the 1950s was delayed. The situation slowly began to change in 1954, when the DFA became incorporated into the MPS, something that promised a more reliable financial support structure in the long term (Henning and Kazemi 2016, 1380).

Addiction as malposition and object of biochemical techniques: The 1950s

It was during this period of institutional insecurity and upheaval that addiction and drugs started to become central objects of research at the Institute. This was due to two new research groups that partly broke with the Institute's previous research tradition. Elements of their research would later lay the groundwork for the neuroscientification and behavioralization of addiction, at least in the German-speaking world.

The first group took a psychiatric-psychotherapeutic approach and was organized around a leading figure: psychiatrist Paul Matussek (1919–2003). Matussek had come to the Institute as a research assistant at the behest of Werner Wagner (1904–1956), who was

then director of the entire Institute (Max-Planck-Gesellschaft 1982, 9).² Working as a psychotherapeutic psychoanalyst, Matussek was a rather unusual figure at the Institute because of the traditional German division between biological psychiatry and psychotherapy that had existed since the beginning of the twentieth century (Roelcke 2008). The DFA clearly belonged to the former; Kraepelin, the founding director of the Institute and a leading psychiatrist, had denounced psychoanalysis as unscientific (Weber 2006a). In contrast, the postwar director Wagner was an interdisciplinary scholar in the natural sciences and the humanities, and he was more open-minded toward psychotherapy and psychoanalysis (Baeyer 1956, 115). Soon after his arrival, Matussek began to establish consultation hours to continue the Institute's clinical work in some measure (Weber 1992). In addition to psychiatric treatment, Matussek now offered outpatient psychotherapy to compensate for the lack of access to psychiatric beds. He continued to fulfill an important research and clinical role in the years following Wagner's sudden death in 1956.

Since the end of the 1950s, Paul Matussek had studied the psychopathology and psychodynamics of addiction using case studies from his psychotherapeutic work in the outpatient clinic. These included an "alcoholic office worker," a mathematics teacher who suffered from "morphine abuse," and a "teacher addicted to sex" (Matussek 1958, 452). Matussek officially included nonsubstance-related addiction in his definition, such as "thumb-sucking addiction, gambling addiction or everyday behaviors such as work addiction" (Matussek 1958, 452). By doing so, he compared addiction to obsessive symptoms, while referring to an "addictive malposition" (*süchtige Fehlhaltungen*). The term "malposition" was coined by Harald Schultz-Hencke (1892–1953) to describe abnormal personality structures within the scope of his neo(psycho)analytical school, which influenced German psychotherapy in the 1950s and 1960s. According to Matussek, the addictive malposition supposedly developed in early childhood and resulted in an "oral fixation" due to an absent father and an overproviding mother (Matussek 1959, 200). In his publications, Matussek explicitly differentiated his psychoanalytical approaches to addiction from other "predominantly biological explanations" (Matussek 1958, 455), which he often criticized for being too reductive. Although he clearly did not pursue a behavioral approach, Matussek established psychological perspectives and prepared the ground for psychotherapeutic treatment for addictive disorders at the Institute.

The second group used a biochemical research approach and was headed by Horst Jatzkewitz (1912–2002). In 1952, he became a research director. In this function, he was to establish a biochemical department at the institute. Although he fit in with the traditional scientific-biological orientation much better than Matussek, he represented a new discipline at the Institute. Jatzkewitz was a chemist—and not a physician—who now also claimed to have expertise in psychiatric issues, and he began researching neural diseases using biochemical methods (Henning and Kazemi 2016, 1379; Sandhoff 2003). Thus, his department heralded the beginning of an era that neuroscientist Wolf Singer later described as the "golden age of brain research" (Singer 1998, 55). Jatzkewitz's arrival marked a gradual trend toward a molecularization and "neuroscientification" of psychiatric issues at the Institute, something that would become more visible from the 1970s onward.

²Personal file Paul Matussek, AMPG, II. Div., Rep 67, No. 997.

Regarding research on drugs and addiction, however, there were certain continuities regarding the Institute's previous research directions in biochemical research. While eugenic approaches to addiction became less relevant, this mainly affected the search for the toxicological mechanisms of drug action. Not only did Kraepelin's traditional research program on drug intoxication continue as a research agenda of "insanity in miniature," it was also reinforced by the discovery of the psychotropic effects of LSD in Switzerland in 1943, which is often seen as the beginning of a psychochemical revolution in psychiatry (Dyck 2008, 31; Tornay 2016, 71). Initially, researchers investigated the physiological actions of LSD through self-experiments, which were then complemented by many new psychopharmacological methods. During the early 1950s, clinical experiments with other test subjects proliferated. In these experiments, subjects were to develop pharmacologically induced model psychoses after taking LSD or mescaline. Norbert Matussek (1922–2009), a chemist and brother of Paul Matussek, took up both research methods. He studied the effects of mescaline with the aim of better understanding the splitting phenomena in schizophrenia (Matussek 2004; Pohlen 2004). His self-experiments resulted in his 1952 doctoral dissertation entitled, "Wahnsymptome im Meskalinrausch" ("Psychotic Symptoms during Mescaline Intoxication"). Norbert Matussek began working in the Biochemical Department under Jatzkewitz in 1956 and later investigated the physiological actions in modern psychotropic drugs (Hippius and Rütger 2010).

In addition, a new chemical-diagnostic approach was devised within the biochemical group. In the early 1950s, Jatzkewitz developed a diagnostic testing method for addictive substances in urine (Jatzkewitz 1954, 1953). His test was based on the new, broadly applicable biochemical method of paper chromatography adopted by several research groups for the intention of developing drug tests (Schmidt 1959). With Jatzkewitz's test, not only nicotine, morphine, and methadone but also synthetic drugs such as amphetamines (especially Pervitin®) could be detected in urine. It took only half an hour to complete the test, and the new chromatographic tests changed the repertoire of medical treatments for addicted patients. For the first time, it became possible to monitor abstinent patients in an uncomplicated and spontaneous way. Some clinicians expressed the hope that the tests would now allow them to carry out the lengthy inpatient withdrawal and rehabilitation treatment on an outpatient basis (Max-Planck-Gesellschaft 1959, 241–42).

Overall, addiction research at the DFA during the 1950s could be characterized by a toxicological-pharmacological approach toward the effects of psychoactive substances, as well as a psychotherapeutic approach to addiction. In the Institute's annual reports, the publications were systematically divided into a brain pathology division and a clinical division (Max-Planck-Gesellschaft 1959, 317–18). The publications on addiction and drugs were integrated into the clinical division, which was still small at that time. Jatzkewitz and the Matussek brothers were the few authors who contributed to the relatively short publication lists of the clinical division,³ carrying out research on other topics simultaneously. Despite a similar research topic, close spatial contact, and personnel overlaps, this did not seem to have led to direct scientific cooperation between the groups. There

³Accordingly, the MPS reports only list a total of nine publications by the Institute's Clinical department for the years 1959 and 1960: Two are by Jatzkewitz, two by Norbert Matussek, three by Paul Matussek, and two by the psychiatrist and geneticist Edith Zerbin-Rüdin (1921–2015), the daughter of Ernst Rüdin (Max-Planck-Gesellschaft zur Förderung der Wissenschaften, 1960, 308).

was no mutual citation evident in their publications and no joint clinical work with patients has been reported; their theoretical and methodological approaches were probably too far apart.

Therefore, it seems that the reason the two different research groups at the Institute became involved with addiction parallel to one another did not come down to direct scientific collaboration but, rather, was due to the influence of contextual dynamics. One factor for the intensified research focus was that addiction phenomena remained an issue in German postwar society. Many people were addicted to alcohol and morphine, but now also to amphetamines like Pervitin®. Extended periods in detoxification and withdrawal centers were common. However, with the adoption of the West German Basic Law (*Grundgesetz*) in 1949, emphasizing the protection of personal freedom, this form of forced placement of drug addicts in psychiatric facilities became increasingly criticized in social and legal discourses as a deprivation of civil liberties (Bundesrat 1952, 260). Moreover, long periods of hospitalization in psychiatric institutions no longer fit with the growing patient population in psychotherapy, which in the 1950s consisted mainly of well-educated, urban professionals. Thus, growing social awareness about addiction and the need for short-term and outpatient therapy might have prompted parallel research on addiction at the Institute, both within the biochemical-diagnostic and the psychotherapeutic approach, albeit with very different outcomes. Not only the new psychotherapeutic technology but also the new technology available for diagnosing substance use fit in well with the growing demand for faster addiction treatments.

Drug dependence as a ‘split object’ within the institute from the 1960s

When the DFA had become incorporated into the MPS in 1945, its financial situation improved, but it had to undergo scientific reorientation. After the MPS had been reestablished as the West German research society that would succeed the KWG after the war, it clearly positioned itself in the field of basic research (Balcar 2019, 15–42; Sachse 2014). This self-definition as an institution for basic research partly served to distinguish the MPS from the old KWG, which had been accused of supporting research related to the military and the war effort during the National Socialist period (Balcar 2018, 15). The basic research impetus might also have been a reaction to certain technology-related research bans imposed by the Allied administration during the postwar years. However, that constituted an obstacle for institutes with a medical orientation, which often focused on therapeutic and clinical applications.

In the 1960s, the DFA’s staff grew. It was renamed the MPIP and was given a new and formative management structure. With the Institute’s stronger integration into the landscape of the MPS, its positioning in basic research became more important. For this reason, the leaders of the Institute increasingly stressed its orientation toward basic research and made this a main organizational principle of its structure.

At the beginning of the 1960s, the division of the DFA, which had already been laid out in the structure of the annual reports, became further consolidated: Two independent institutes were now officially created under one roof—a theoretical institute with an experimental and brain pathology focus, and a clinical institute that included therapeutic patient treatment (Max-Planck-Gesellschaft 1992, 68). When long-vacant leadership positions were eventually filled at the beginning of the 1960s, the two successful contenders both

emphasized basic research as their main goals. Gerd Peters (1906–1987), who was appointed overall director of the Institute as successor to Wagner, was a medical doctor and neuropathologist and held this position from 1961. Detlev Ploog (1920–2005), a psychiatrist, anthropologist, and behavioral scientist, assumed the directorship of the Institute’s clinical division from 1964 onward (Ploog 1992; Weber 2006b). Both interpreted “basic research” in a specific way—namely, as a reorientation to questions of somatic psychiatry. In his inaugural address, Peters announced that the entire Institute would be reserved for “natural scientific research” consisting of “basic psychiatric research” investigations of the “somatic foundations or correlations of the psyche.”⁴ In 1966, when an inpatient ward that served the clinical division eventually opened, the Institute became officially renamed the Max Planck Institute of Psychiatry. At the inauguration ceremony, the speakers emphasized the clinic’s basic scientific principles and its process of patient selection for research purposes.⁵

During the institute’s expansion in the 1960s, new leadership figures arrived and established their own departments and groups. In 1962, physician and pharmacologist Albert Herz (1921–2018) intensified neuropharmacological research at the Institute’s theoretical division (Max Planck Institute for Neurobiology, 2018). In 1964, psychiatrist Wilhelm Feuerlein (1920–2015) became head of the psychiatric polyclinic at the Institute. Johannes Brengelmann (1920–1999), a physician and psychologist who had worked with Hans Eysenck (1916–1997) and Aubrey Lewis (1900–1975) in London for 10 years, joined the clinical division in 1965 as head of the Psychology Department.⁶ During the course of the 1960s, the new departments not only needed to develop their own profiles within the institutional research framework but were also asked to position themselves as basic research units. Although Herz belonged to the Institute’s theoretical division, positioning within basic science research was not so easy for members of the clinical division (e.g., Ploog, Feuerlein, and Brengelmann), as their work basically involved patient care. Accordingly, the clinical groups employed different strategies to situate themselves in basic research. One of them was through animal experimentation. In facilities such as the primate center established by Ploog in the early 1960s, basic psychological mechanisms could be examined in their close relationship to biology. However, two other strategies were of particular importance: the selection and exclusion of research that was supposedly too applied and the choice of specific research objects—namely, the effects of drugs and addiction.

Boundary work: The exclusion of psychodynamic psychotherapy

Research in STS has shown that the development of common research fields—such as scientific and somatic psychiatry, as stipulated by Gerd Peters—often requires boundaries and exclusions (Gieryn 1983; Porter and Stahnisch 2015). Depending on the respective research contexts, fields of science distinguish themselves from nonscience as well as basic from applied science through discursive and practical boundary work. In the case of the

⁴Inaugural speech by Gerd Peters in Chronik des MPIP, AMPG, II. Div., Rep. 30A, No. 87.

⁵“The admission of patients is not based on need or severity of the case, but rather only on the Institute’s respective research.” Report by the medical journal *Ärztblatt* from 1966 on the inauguration of the clinic in: Chronik des MPIP, AMPG, II. Div., Rep. 30A, no. 87.

⁶Personal file Brengelmann, AMPG, II. Div., Rep. 67, No. 392, Vol. 1.

MPIP, the new leadership and actors of the clinical division performed boundary work to emphasize their epistemic opposition to psychotherapeutic approaches that had existed at the Institute since the 1950s and that were now characterized as too practical and unscientific.

At the beginning of the 1960s, Peters, as the new Institute director, reorganized the MPIP as a whole—something that included the establishment of a uniform structure.⁷ This led to attempts to exclude Paul Matussek from the Institute. The rationale provided for this in the ensuing senate meeting of the MPS was that Matussek, in his capacity as a psychiatrist with a psychodynamic orientation, did not “fit in with the scientific views of the Peters/Ploog group” and that the entire Institute “gained a truly organic character” through Matussek’s exclusion.⁸ As a distinguished employee with many years of service, Matussek could not easily be removed from his position, and as a result, the Institute administration was unable to terminate Matussek’s employment. Yet they could isolate him; with the opening of the inpatient clinic in 1966, the management team provided Matussek with his own research unit for “Psychopathology and Psychotherapy” (Max-Planck-Gesellschaft 1982). The Matussek unit was not only physically relocated to an external villa that was rented for this specific purpose but it was also institutionally separated from the MPIP. Because the department was no longer part of the Institute, its publications were no longer published in the Institute’s annual reports, as the analysis of these reports shows.

To mitigate the consequences of his institutional exclusion, Matussek subsequently tried to become a scientific member of the MPS in the mid-1960s, as that would have given him voting rights in decisions of the Society. Leading figures of the Institute such as Peters, Ploog and, Brengelmann—themselves already scientific members—repeatedly rejected this. In one of the explanations given for his rejection, the specific boundary work between basic and applied research becomes evident. Brengelmann, for example, explained that Matussek did not fit in with the MPS because the Society’s aims were to “treat human behavior scientifically.”⁹ His position was supported by his former supervisor, Hans-Jürgen Eysenck, who had already proved to be a bitter critic of the theories of (psychodynamic) psychotherapy (e.g., Eysenck 1952). In his evaluation report of Matussek regarding scientific membership, Eysenck wrote that Matussek was perhaps even an “excellent clinician.” Yet at the same time, he emphasized that Matussek “did not seem to me to possess the proper seriousness of the research worker.”¹⁰ Characterized as a “clinician,” Matussek’s approach was now presented as being too applied to fulfill the epistemic requirements of basic research.

Ultimately, Matussek was never accepted as a scientific member. By isolating and removing him, Peters and influential actors from the clinical division were able to consolidate their own influence and their postulated orientation toward basic research, understood as somatic psychiatry. Matussek’s double exclusion—from the Institute and the clinical department—therefore entailed the drawing a boundary line between the inside and outside of the institute, scientific and nonscientific psychiatry, as well as basic research and clinical application.

⁷Detailed measures concerning the restructuring of the Institute can be found in a letter by Gerd Peters dated October 14, 1980, taken from the history of the MPIP, AMPG, II. Div., Rep. 30A, No. 87.

⁸Minutes from the senate meeting of June 23, 1965, in Ludwigshafen, in Matussek’s personal file, AMPG, Div. II, Rep. 67, No: 997.

⁹Brengelmann’s letter to Weber dated March 13, 1969, in Matussek’s personal file, AMPG, Div. II, Rep. 67, No: 997.

¹⁰Letter from Hans-Jürgen Eysenck to W. Grassmann from the biological-medical division of the Scientific Council dated February 8, 1965, in Matussek’s personal file, AMPG, Div. II, Rep. 67, No. 997, and Div. II, Rep. 62, No. 999.

After his organizational and discursive exclusion, the psychodynamic perspective on addiction that Paul Matussek established in the outpatient clinic during the 1950s was virtually abandoned by the Institute. Developmental etiologies and open criticism of biological-psychiatric models also disappeared. Nevertheless, the psychotherapeutic approach to addiction was to be reintroduced to the clinical division of the Institute soon after, by Matussek's critic Brengelmann and under a behavioral and officially sanctioned scientific banner.

Drug dependence as an object of basic research from the 1960s to 1980s

One research topic at the Institute had emerged with increasing frequency during the period when the demand for basic research was particularly virulent. During the late 1960s and early 1970s, the terms “addiction” and “drug dependence” began to appear more and more on the Institute's publication list, in both the theoretical and the clinical divisions, and despite the otherwise heterogeneous research topics pursued. Thereby, the listed publication titles of the time show a visible modification. In 1964, the term “dependence,” which was preferred by the WHO, began to gradually replace the older term “addiction.” This was accompanied by conceptual changes. With the disappearance of the psychodynamic perspective, the preoccupation with nonsubstance addiction also vanished. Now, different research groups focused on substance dependence, especially heroin, opioids, and opiates. At the same time, researchers picked up on some of the toxicological and biochemical approaches to addiction from the 1950s and translated the concept of substance dependence into neurochemical and neuroscientific experimental systems and discourses. Finally, drug dependence was also integrated into behavioral frameworks.

Several factors contributed to an increase in and diversification of research on drug dependence at the Institute. First, the widespread fear of a drug wave in West German society at the time provided many incentives and led to more funding for research projects on the subject. This helped raise interest among the Institute's various new researchers and might also be a reason why heroin—then considered the most dangerous element of the drug wave—became central to diverse scientific endeavors at the MPIP. Second, the WHO's broadened definition of addiction from 1957 onward played a role.¹¹ This is because the definition established a twofold criterion for drug dependence that now included both psychological and physical aspects (Peters 1962). This broad definition offered the heterogeneous groups at MPIP, whose differences were even reinforced by the institutional split into clinical and theoretical divisions, numerous possibilities to connect to drug dependence as an object of research. Thus, the dual nature of drug dependence allowed for a wide range of research on psychological and physical mechanisms and effects. Finally, research on addiction and drug dependence fit with the premise of basic research—at least in the way that the director, Peters, had interpreted it: as the search for somatic foundations and biological correlates of the psyche. After all, drug dependency was attributed to drugs—that is, to material entities with physiological effects. Therefore, the psychoactive effects of drugs provided a distinct and definite causal model for tracing psychological phenomena and mental functions back to material-physical processes. As early as 1962, Peters had published

¹¹In the WHO definition, the third of a total of four criteria is “a psychic (psychological) and generally a physical dependence on the effects of the drug” (WHO, 1957, 10).

an essay on “Biological Research in Psychiatry” at the Institute. In this text, he emphasized the central position of the biochemical analysis of drug effects within “the framework of biological basic research” and declared, “no one will doubt that pharmaceuticals can cause emotional change and a change in behavior by primary influence on somatic processes” (Peters 1962, 94). This placed the materiality of drugs and their effects in the foreground, which contributed to a decline in interest in nonsubstance related addictions during this period and reinforced the premises of a biological model of mental functions.

Neuroscientification of drug dependence: Two research programs from the 1960s and 1970s

Two of the Institute’s departments especially embraced drug dependence as a research object during the 1960s: psychiatry from the clinical division and neurochemistry from the theoretical division.

At the Institute’s Clinic for Psychiatry, its director, Wilhelm Feuerlein (1920–2015), built his entire scientific career on the research and treatment of substance dependence, especially alcohol dependence. The WHO classification was of central importance to him. Not only did he cite and discuss it in his publications, it also shaped his multidimensional views on dependence as a psychiatric object. In 1968, Feuerlein had submitted his second German academic dissertation (“Habilitation”) on the topic of delirium tremens (Schlee 2016). This habilitation was already programmatic. Using “biometrical methods,” Feuerlein examined the dispositional aspects as well as clinical, social, and psychological factors of substance dependence. Although he concentrated primarily on alcohol abuse, he nevertheless continued to publish on the general abuse of drugs including cannabis, LSD, and morphine. In the early 1970s, Feuerlein published an influential book that demonstrates in its title the multifaceted impact of dependence: *Sucht und Abhängigkeit. Ihre physiologischen, psychologischen und sozialen Grundbedingungen (Addiction and Dependence: Their Basic Physiological, Psychological and Social Conditions)*; Feuerlein 1974).¹²

In the book, Feuerlein wrote in a positive tone about the fact that the WHO renamed drug addiction as dependence and, in particular, its “dual nature” in terms of both the physical and psychological forms of dependence. Among the psychological factors, he cited a wide range of both psychodynamic and learning-theory models, as well as neurophysiological aspects. In terms of neurophysiology, he referred to experiments in brain stimulation in laboratory animals using implanted electrodes. Under certain conditions, the animals would even apply electrical stimuli to the brain themselves by pressing a lever to “attain a high level of pleasure,” corroborating the neurophysiological model of substance dependence (Feuerlein 1974, 6). Thus, he referred to a growing approach in addiction research based on animal experimentation, which had begun in 1940 with the publications of Sidney Spragg (1909–1995) at Yale University on drug addiction in dogs and monkeys (Ahmed 2019). Spragg’s conclusion that people as well as animals could become addicted further strengthened the biological causal model of drug dependence. It, in turn, encouraged and advanced brain research in this area and led to the intracranial stimulation experiments in rats by James Olds (1922–1976) and Peter Milner (1919–2018) at McGill University. In their

¹²The title of the book well reflects the triad of “subject, substance, society” from the psychological, physiological, and social mechanisms that Tanner (2019a, 2019b) identified as a research paradigm during the 1970s.

study, Olds and Milner used the behaviorist term “positive reinforcement” and operant conditioning; they also conceived of addiction as a neuronal stimulation of the pleasure center or reward circuit (Olds and Milner 1954).

While Feuerlein was active in the MPI’s clinical division and worked with psychiatric patients, the neurological exploration of drugs intensified and changed in the Institute’s theoretical division. Feuerlein conceived of the neurophysiological aspects of substance dependence as electrical brain stimulation in animal experiments. At the theoretical division, animal experimentation dominated as well, using rats, pigs, and rabbits. However, researchers at the theoretical division now focused on neurochemical processes and not on electrophysiological effects. This turn to neurochemistry might have been partly influenced by the older pharmacological-toxicological and biochemical traditions, which were prevalent at the institute in the 1950s and earlier. But this research perspective now shifted. It no longer focused only on drug effects, on the evidence of drug use detected by Jatzekwitz’s older urine test, or on the effects of LSD and mescaline analyzed by Norbert Matussek. Now the focus shifted toward substance dependence itself, a topic that formerly belonged exclusively to the clinical division.

In the new line of neurochemical research, there were now other key figures. One was Albert Herz, along with researchers from his growing neuropharmacological group, who mainly focused on opioids and opiates. Herz had already shown an interest in the relationship between drug effects and physiological conditioning while at the University of Munich in the 1950s and early 1960s (e.g., Herz 1960). Referring to the approaches of Ivan Petrovich Pavlov (1849–1936) and Burrhus Frederic Skinner (1904–1990; i.e., classical and operant conditioning), Herz had investigated the influence of drugs on conditioned avoidance behavior in animal experiments. Following his arrival at the MPIP in 1962, Herz established a working group that mostly used rats as model organisms and concentrated on the areas of activity and the action mechanisms of opiates, especially morphine (Albus, Schott & Herz, 1970; Herz 1960). In the late 1960s, he successfully localized the brain region where morphine exerts its pain-regulating effect—namely, the periaqueductal gray (Max-Planck Institut für Neurobiologie 2018). This research made him internationally well known.

His approach did not simply add a neurochemical level to research on pharmacological-toxicological effects like LSD research had done. It also moved away from the previous focus on short-term drug effects, understood as models for other mental disorders, such as psychoses. Now, neurochemical drug action was no longer an epistemic detour to another research object; it was itself the primary research object and directly connected to the mental disorder of dependence. In this way, the neurochemical manifestation of drug dependence emerged as a scientific object in its own right. Accordingly, Herz’s group also investigated the neurochemistry of withdrawal syndromes related to opiates, as well as receptors and endorphins in opiate addiction (operationalized on morphine-dependent rats; Bläsig et al. 1972; Höllt et al. 1978).

In 1974, Herz assumed the directorship of the Neuropharmacology Department at the MPIP. His research became increasingly represented in the Institute’s annual reports, which explicitly emphasized its importance for the treatment of heroin dependence (Max-Planck-Gesellschaft 1980, 323). Herz opposed the classical hypothesis that opiates alter individual neuron cells—something that was known as the “unitary theory” and referred back to the work of Charles Ernest Overton (1865–1933) and Hans Horst Meyer (1853–1939) from the beginning of the twentieth century (Krasowski 2003). Instead of focusing on a single

neuron, drug dependence was now being defined as “adaptive changes in the chains of neurons” (Max-Planck-Gesellschaft 1984, 362). Not just one but several connected nerve cells were interpreted as contributing to a hypersensitivity to certain neurotransmitters. The model of chains marked an important shift toward organic cross-linking and contained a temporal dimension as well. Instead of the immediate effect, as in the toxicological concept, the focus shifted toward long-term modifications and successive neuronal processes. Although the idea of neuron chains was later rejected as too mechanistic and gave way to more complex models (Campbell 2019), it linked the concept of substance dependence to specific brain regions, molecular processes, and neuronal definitions. In this way, the neurochemical research group led the way toward a neuroscientification and molecularization of drug dependence.

Behavioralization of dependence: Clinical psychology research programs in the 1970s and 1980s

Following Feuerlein’s and Herz’s research programs in the 1970s, the Psychological Department under Brengelmann began to conduct research into drug dependence. In 1973, while publishing the edited collection *Behavior Therapy* together with Wolfgang Tunner (b. 1937) from the Clinical Psychology Department at the University of Munich, Brengelmann contributed the article “Drug Dependence Therapy” (Brengelmann 1973). The book itself was based on a conference that had taken place two years earlier—namely, the first meeting of the European Association of Behavior Therapy, held July 20–23, 1971 in Munich. It was likewise the third meeting of the *Deutsche Gesellschaft für Verhaltenstherapie* (German Society for Behavioral Therapy). Both associations were cofounded by Brengelmann. In the introduction of the book, Brengelmann clearly positioned his behavioral approach within the field of experimental research and science. In addition, he defined behavioral therapy as “a discipline which applies experimental conditions for the purpose of therapy on the basis of theoretical and methodical findings of behavioral sciences, especially those of learning psychology” (Brengelmann and Tunner 1973, v). He criticized the vague and “dubious” understanding of behavior therapy held by some psychotherapists as a “melting pot,” adding, “Such deviations from the original concept characterize the problem of the applied sciences” (Brengelmann and Tunner 1973, v). In doing so, he set himself apart from applied research, which he characterized as too practice-oriented, and positioned himself in scientific and experimental basic research.

Brengelmann defined drug dependence in his text as a multifactored phenomenon and emphasized the “phenomenon of multiple abuse,” which ranges from marijuana to hard drugs (Brengelmann 1973, 75). In doing so, he also referred to the “dual nature” of drug dependence by referring to physical and psychological forms. Unlike Matussek earlier, he did not directly criticize models of biological psychiatry but integrated them into his definition of substance dependence. Nevertheless, Brengelmann assigned his research to one side; according to him, psychiatry had focused too much on physical symptoms up to this point. The more difficult “elimination of psychological dependence” had, however, been neglected (Brengelmann 1973, 79). After criticizing the effectiveness of the psychotherapeutic methods available, Brengelmann suggested treating the problem of psychological dependence by using the new approach, at the time, of behavior therapy. In so doing,

he followed the general trend of behavioral therapy methods developed in the United States, the United Kingdom, and South Africa, which were spreading to Germany and other European countries (Fichter 2006).

At the same time, behavior therapy had points of connection to other research traditions and contexts at the Institute. For example, Herz had applied learning-theory principles of conditioning to research in animal experiments. Furthermore, the introduction of behavior therapy at the Institute was facilitated by the fact that contemporary neurological research, especially the experiment by Olds and Milner, was often entangled with behavioral approaches (Olds and Milner 1954). This proximity to somatic research endeavors became further flanked by the field of behavioral psychopharmacology, which emerged in the United States in the late 1950s, while combining behavioral experimental psychology with research on the effects of psychoactive drugs (Laties 2003). Against this background, Brengelmann (1973) proposed various principles of learning theory to treat people with drug dependences by reducing undesirable behaviors and promoting desirable behaviors in their place. These included contemporary clinical methods, such as aversive conditioning, combined with cognitive techniques related to covert sensitization¹³ or token economies.¹⁴ In this way, the clinical phenomenon was psychologized, but not within a psychodynamic framework as it had been previously. Now, drug dependence became a question of behavior.

In 1973, the year in which Brengelmann's pivotal essay on drug dependence was published, he received approval for funding, which he had applied for through the MPIP's Psychology Department, toward a new project group on drug dependence (Rauschmittelabhängigkeit, 1973). He led the new group together with the psychologist Gerhard Bühringer (b. 1947), who was quoted in the introduction of the present article. The project's aim was to develop and test behavioral psychotherapy for drug dependence. As with the Herz group, the focus was now placed on opiates and opioids, especially heroin dependence. The project also used a conceptual metaphor to define drug dependence—that of “chains.” However, the new project group did not mention “chains of neurons” but used the term “chains of behavior” in its publications on drug dependence, in this way referring to principles of learning theory (Bühringer et al. 1975, 20). Accordingly, drug dependence was defined by a chain-like sequence of learned behavior patterns. The simultaneity of the chain metaphors and the conceptual proximity to the Institute's theoretical division might have been mere coincidence, but it might also be conceived of as a strategic attempt by psychologists from the clinical division to closely align themselves with the rhetoric of basic research and modern biological psychiatry.

Chains of behavior and chains of neurons: Drug dependence as a split object

Overall, there was a great deal of overlap between the different research groups on drug dependence from the clinical and theoretical division at the Institute, and not just in that they were all studying questions of dependence at the same time at the same institution. They used metaphors that were partly similar; they dealt with substance dependence and referred to the WHO definition that stabilized the multiple phenomena of dependence; they

¹³This technique is related to operant conditioning. Undesirable behavior (e.g., thinking about drugs) is therapeutically combined with uncomfortable thoughts (e.g., physical harm).

¹⁴Desirable behavior (e.g., personal hygiene) is rewarded with tokens that patients can exchange for other reinforcing items (e.g., day release from the clinic).

all operated under the principle of basic research; they were subject to the same administrative rules; they all worked at an institution with a research clinic that had many addiction patients; and they partly shared similar theoretical and empirical foundations in regard to dependence that were evident, for example, in references to behaviorism or practices of animal experimentation. And, at least in the English-speaking context, the concept of “brain stimulation reward,” which combined behavioral and neuroscientific approaches, began to emerge in the 1970s (Campbell 2019, 242). Against this backdrop, it seems likely that the different groups at the MPIP could have ended up aligning their material, social, and epistemic components; built joint “repertoires” (Ankeny and Leonelli 2016); and started multidisciplinary collaborations. Accordingly, it appears plausible that the common research topic of substance dependence might have acted as a boundary object, at least in some specific research contexts.

A closer look at the historical sources, however, reveals an almost astonishing lack of collaboration, cooperation, or even mutual acknowledgment at the Institute. Various findings point to an isolation of the working groups and to a parallel but relatively separate focus on drug dependence, which suggests that there were “multiple commitments” and heterogeneous lines of research (Campbell 2019).

One example is the recently mentioned behavior therapy approach in the group around Brengelmann. Although his 1973 text on drug dependence could have certainly established connections with the Institute’s psychiatric and neurochemical projects simply based on the topic, no explicit references were made despite the chain metaphor being used. Brengelmann did not mention—either in his argumentation or in the bibliography—the term “brain”; nor did he refer to neuroscientific etiological models or the work by Institute colleagues at other departments.

This omission also applied to translations into clinical practices: In the therapy manuals published later by the “drug dependence” group, there was frequent use of psychoeducation on the etiology of the disorder. For example, patients were to learn to explain behavioral terms such as “learned triggers,” “behavior chains,” and “reinforcing cues” verbally and in writing (Kraemer, Prop-Alternative, and de Jong 1980, 132). Although biological triggers were sometimes mentioned in the manuals of this time, references to neurophysiological or neurochemical triggers were lacking. Although neuroscientific models and references to the brain and “brain chemistry” are common in today’s manuals about behavior therapy in Germany—even in relatively current texts by former members of Brengelmann’s group (Täschner et al. 2010)—they had not yet appeared in texts from that period. No common etiological concept had yet been advocated at the MPIP that could have connected the different approaches.

Also, in the publications on drug dependence by the other departments of the Institute, there were generally few mutual citations or references to other models. Multidisciplinary, cross-departmental projects and coauthorships were largely unknown. Contemporary witnesses confirm that there was little contact between the Institute’s theoretical and clinical divisions, and collaboration was barely possible.¹⁵ Due to the overall lack of scientific cooperation, drug dependency as a research topic at the MPIP can indeed be described as a kind of split object. Like the boundary object, it is both adaptable and robust. But lacking cooperation

¹⁵Interview with Gerhard Bühringer and Lisa Malich on August 16, 2019. Wolfgang Singer also mentions similar distinctions between the Institute’s clinical and theoretical divisions in an interview in this special issue of the *Journal of the History of the Neurosciences* (Singer and Topp 2021). However, Singer emphasizes that the intention for translational cooperation certainly existed, and that informal communication took place—for example, in the Institute’s cafeteria.

between different actors and groups, such split objects tend to enable mutually exclusive coexistences in a given institutional context. To some extent, its status as a split object entailed a “dependence multiple” (Campbell 2019; Mol 2002) within the MPIP’s research context: Drug dependence was enacted at times as a psychiatric, as a neurochemical, and as a psychological object. The lack of contact and institutional coordination between the polymorphous objects at that time led to the neuroscientification and molecularization of dependence, on the one hand, and to its psychologization and behavioralization, on the other.

The fact that researchers from the MPIP almost simultaneously took up drug dependence as a research topic—albeit in the specific form of a split object—was a result of socio-political and administrative processes. One major factor was the WHO’s modified definition of the term, one that conceptualized a dual nature for the physical and psychological symptoms of drug dependence. This new definition offered a weak structure through which different ontologies could coexist and did not have to enter into direct competition. At the same time, the definition was robust due to its official character as diagnosis. On a local level, the WHO’s diagnostic category aligned well with the contemporary circumstances at the Institute in Munich: The category of dependence fit in with models of somatic psychiatry as it described the effect of chemical substances on mental phenomena. Moreover, the conceptual dichotomy of the WHO aligned with the separation of the Institute into a theoretical and clinical division. In this way, physical dependence could be investigated through neurochemical projects in the MPIP’s theoretical division. And in the clinical division, psychotherapeutic and psychiatric projects could focus on psychological and behavioral aspects of drug dependence. Therefore, the dichotomous diagnostic category facilitated research groups in remaining unconnected but operating within the same institutional context of basic research without major epistemic conflicts.

A few years later, the split, which had already manifested itself in the split object, continued even further. In 1984, the theoretical division moved into a new building located in the neighboring town of Martinsried. The final separation took place in 1998, when the Theoretical Institute became the independent Max Planck Institute of Neurobiology (Max-Planck-Gesellschaft 2017). The entire institution had now not only differentiated but officially split.

Conclusion: The “dependence multiple” in German basic research

At the MPIP, the category of drug dependence was taken up by multiple research groups at the same time. It was here that the ideas of drug dependence as a brain disease or behavior problem had emerged and spread within the German-speaking academic world since the 1960s (see Figure 2 for an overview of the timeline), albeit initially along parallel but separated pathways. The fact that drug dependence was explored as a research object by multiple actors was the result of an incidental (to some extent) combination of different factors. These include general fears that a drug wave might become virulent in German society, the establishment of addiction as a diagnostic and clinical category, and the fact that the topic helped to reinforce biological theories of mental functions that aligned well with the Institute’s reorientation toward somatic psychiatry under the guise of basic research. This saw the gradual emergence of the trajectories of behavioralization and of neuroscientification that are dominant today.

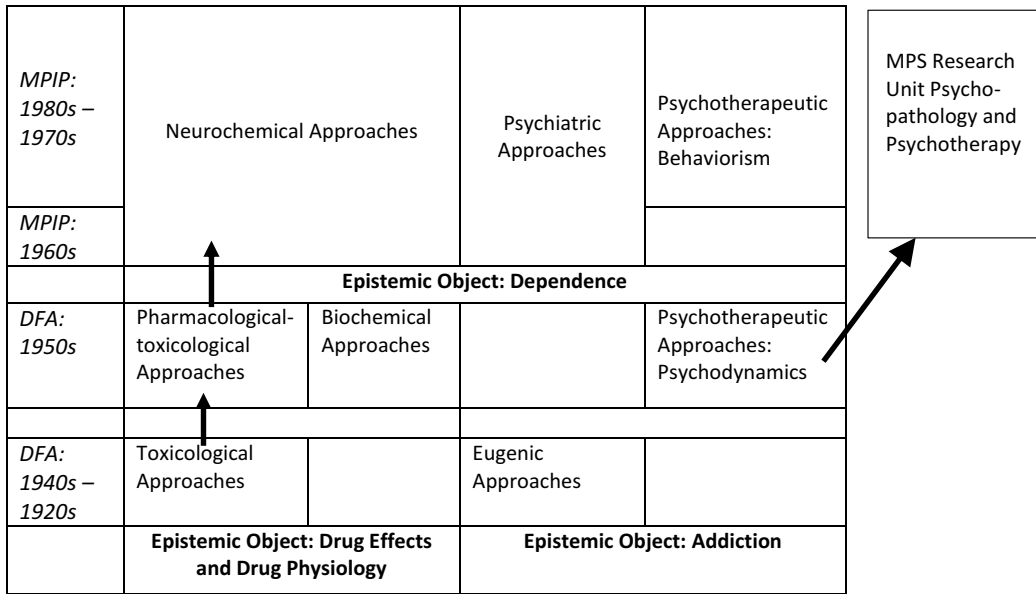


Figure 2. Chronology of research on dependence at the MPIP.

The first trajectory of behavioralization, in which drug dependence finally emerged as an object of behavioral psychotherapy, emerged in the clinical sections of the MPIP and consisted of different stages. As early as the 1950s, researchers at the Institute took up addiction as a psychotherapeutic and psychological problem, conceptualized it psychodynamically, and established an open definition that included forms of addiction that were not related to substances. However, these psychodynamic approaches were soon excluded from the Institute for supposedly being “too applied.” Not long after, other groups in the Institute’s clinical division reintroduced addiction as a psychotherapeutic and psychological problem, albeit in the form of the substance-related concept of drug dependence, in this way aligning themselves to somatic psychiatry. In the 1970s, drug dependence proved to be a highly successful research subject at the Institute, facilitating the wider behavioralization of the concept.

The second pathway, neuroscientification, was more closely related to the theoretical division of the MPIP. It was more multifaceted and rooted in older lines of the Institute’s tradition. In part, this trajectory goes back to toxicological research on drug effects that began at the Institute as early as the 1920s, gaining new momentum in the 1950s with the general psychopharmacological turn in psychiatry. At the same time, the development of clinical diagnostic test methods for drug detection began in the 1950s in the new biochemistry group at the MPIP. Finally, by the 1960s, toxicological and chemical researchers no longer concentrated solely on drug effects they had used in the hope of shedding light on biomedical models for other mental illnesses. Instead, their focus shifted to addiction as a mental illness itself. Against this backdrop—and fostered by the new WHO definition—drug dependence became a research topic not only in the clinical groups but also in the theoretical groups at the Institute. This promoted neurochemical models that formed important elements of a general neuroscientification of drug dependence.

Although the two lines of “neuroscientification” and “behavioralization” have converged today, their relationship to one another has varied historically and they initially developed separately. The new groups at the Institute that took up the same research subject in the 1960s did not collaborate directly or even refer to one another’s work. For this reason, drug dependence did not really rise to a boundary object at the Institute, instead forming as a split object, at least in the time period under analysis.

Although collaborations have often been studied and theorized in science studies, what remains overlooked is that many researchers do not collaborate even when they are working on similar topics. The concept of split object and an attention to coexistence may help to better understand such cases of noncollaboration. At least in large scientific institutes, coexistence without major epistemic conflict seems common and might actually be considered the default settings of “normal science.”

The question remains as to whether, when, and how neuroscientific and behavioral ideas of drug dependence entangled and overlapped in the subsequent years. That question goes beyond the scope of this article and still represents a research desideratum for Germany. It is likely that the period from the late 1980s onward was pivotal: a period when behaviorist understandings of addiction were enshrined, the concept of brain-reward circuits circulated more widely, and neuro-imaging technologies such as PET or MRI entered into the field of addiction research, which enabled more collaboration in research practices (Campbell 2019, 242–243). What is certain is that both concepts have now become united in current German-speaking textbooks on addiction therapy. This is also illustrated by the quote in the introduction to this article by Bühringer, who began his career at the Institute and was a student and later collaborator of Brengelmann. Unlike in his earlier publications from the 1970s and 1980s, Bühringer and his coauthors mentioned both notions in their textbook published in 2010 (Täschner et al. 2010). Here we see drug dependence appears not only as behavioral dysfunction but also as brain disease—now the two trajectories coexist and overlap within the material unit of one book.

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