Addictive Disorders

20

Moritz de Greck and Georg Northoff

Abstract

Addictive disorders cause profound changes in behavior and subjective experience. The addictive behavior will preoccupy the patient's thinking and dominate his motivations. It will become essential for the patient's well-being.

From a neurobiological point of view, the reward system (including nucleus accumbens, amygdala, and the prefrontal cortex) plays a key role in the formation of addictive disorders.

From a psychodynamic perspective, the four psychologies of psychoanalysis (including drive theory, ego psychology, object relations theory, and self psychology) developed complementary concepts which are helpful in our understanding of the function of addictive disorders.

The knowledge of the neurobiological underpinnings and psychodynamic concepts of addictive disorders leads to new implications for their treatment.

20.1 Introduction

Humans can develop a wide spectrum of addictive disorders. It is useful to differentiate between substance-related and non-substance-related addictive disorders. Substance-related disorders include alcohol addiction, benzodiazepines

M. de Greck (✉)
Department for Psychiatry, Psychosomatic and Psychotherapy,
Johann Wolfgang Goethe University Hospital, Frankfurt am Main, Germany

G. Northoff
Mind, Brain Imaging, and Neuroethics,
Institute of Mental Health Research, University of Ottawa, Ottawa, ON, Canada
e-mail: georg.northoff@theroyal.ca; www.georgnorthoff.com

H. Boeker et al. (eds.), *Neuropsychodynamic Psychiatry*,
https://doi.org/10.1007/978-3-319-75112-2_20

addiction, opioid addiction, and others. On the other hand, pathological gambling, computer game addiction, Internet addiction, and sexual addiction are included in non-substance-related addictive disorders. For many substances and activities, there is a recreational, non-pathological form of consumption. If a person loses his ability to control consumption, however, and is instead subjected by inner obsession and if feelings, thoughts, and activities are dominated by consumption, a recreational use transforms into an addiction. In addition, behavioral patterns, similar to addictive activities, occur in several other psychiatric disorders such as, for instance, eating disorders or obsessive compulsive disorders.

20.2 Case Report: Mr. J. (26 Years): Part 1

20.2.1 Admission

Mr. J., a 26-year-old student with engineering major, was admitted to day-clinic treatment. The treatment was recommended by his outpatient psychotherapist. The duration of the treatment was planned to last for several weeks. Mr. J. was the only child of his parents. His relationship with his parents was rather oriented on achievements than keenly empathic. At the time of admission, Mr. J. was living alone. He was receiving financial support by his parents. He was also earning money by a part-time job as a software engineer. He separated from his girlfriend (a teaching student of the same age) about a year before admission; since then, he was single. During the admission interview, Mr. J. explained that he spent more and more time in the Internet, in particular browsing through news and information sites. His Internet time increased to about 6 h/day at the time of admission. His Internet activities had troubled him since about 2 years. For instance, he often argued with his girlfriend about his Internet activities, which finally led to the separation after 3 years of relationship. He intended to reduce his Internet time for several times; however, he could not control his urges and gave up each time. During the last months, he should have spent more efforts on his study. Due to poor preparation, he recently failed in an important test. As a consequence, he can now only finish his study with a delay of 1 year. He knew that he should have concentrated more on his study; however, the urge to surf the Internet was stronger. He took the averted graduation as a reason to seek for therapeutic support. Having spent few sessions with his outpatient therapist, though, his therapist recommended to switch to a day-clinic treatment, since the outpatient treatment seemed not sufficient to deal with his problems. During the admission interview, Mr. J. also mentioned that he was unsatisfied with his lack of social contacts and activities, as well as his few sporting activities. He described himself as a socially cautious person; however, this got more severe during the last years.

20.2.2 Diagnostic Criteria

The German psychiatrist and psychoanalyst Mentzos (2009) described a restrained inner freedom, restricted flexibility, and repeated loss of control as key features occurring in all addictive diseases. Driving forces behind addictive behaviors are the urges to achieve pleasant affective states of relaxation and/or stimulation.

The psychologist M. Griffiths defined six core criteria of addictive disorders (Griffiths 2005; Andreassen et al. 2012): salience (i.e., the addictive activity dominates thinking and behavior), mood modification (i.e., the activity modifies or improves mood), tolerance (i.e., increasing amounts of the activity are required to achieve previous effects), withdrawal (i.e., unpleasant feelings occur when the activity is discontinued or suddenly reduced), conflict (i.e., the activity causes conflicts in relationships, work, education, or other activities), and relapse (i.e., addictive disorders imply a tendency to revert to earlier patterns of the activity after abstinence or control).

The DSM-5 (American Psychiatric Association 2013) lists 11 criteria, as common diagnostic characteristics independent from the specific substance of abuse:

1. The substance is taken in larger amounts or more often than intended.
2. There is a desire or there have been attempts to cut down substance use.
3. A great deal of time is spent in order to obtain the substance, use it, and recover from its effects.
4. There is craving for the substance.
5. Substance use results in failures to fulfill obligations at work, at school, or at home.
6. Substance use is continued despite social or interpersonal problems caused by the substance use.
7. Important social, occupational, or recreational activities are given up or reduced to use the substance.
8. The substance is used, although it is physically hazardous.
9. The substance is used, despite knowledge of physical or psychological problems caused by the substance.
10. Tolerance develops, i.e., increasing amounts of the substance are needed to obtain the same effect.
11. Withdrawal develops in substance-free episodes.

20.3 Case Report: Mr. J. (26 Years): Part 2

20.3.1 Diagnostic Criteria

Mr. J. fulfilled several criteria for addiction. For instance, Mr. J. was unsatisfied with his Internet behavior and the amounts of time spent online. In the past, he had made several vain attempts to cut down his online time. But instead he steadily increased

his Internet time. Due to his Internet activities, he got problems with his girlfriend, finally leading to their separation. In addition, he wasn't able to fulfill important obligations concerning his study.

20.3.2 Psychodynamic Concepts

20.3.3 The Formation of Addictive Disorders: Perspectives of Different

20.3.3.1 Psychoanalytic Schools

The psychoanalyst Pine (1988) differentiated four conceptually separable psychological perspectives, which developed within the psychoanalytic framework: drive theory, ego psychology, object relations theory, and self psychology. Each of these psychoanalytic schools has improved our understanding of psychodynamic mechanisms underlying addictive disorders enormously.

20.3.4 Drive Theory

Drive theory was developed by S. Freud. Until the invention of drive theory, symptoms of addictive disorders were seen as a consequence of toxic effects of the drug of abuse. The motives underlying drug intake were not object of much consideration. S. Freud was the first to emphasize the question: what led addicted patients to consume a noxious drug (Radó 1933)? In view of drive theory, addictive disorders form on the basis of disturbed libido development, and addictive behaviors serve as a surrogate for prohibited gratifications of the sexual drive. Freud viewed masturbation as the origin of all addictive disorders (which might follow, Subkowski 2008; Freud 1962). Apart from this, Freud wrote rather scarcely about addictive disorders (Subkowski 2008).

According to drive theory, the ecstasy induced by drug consumption serves as a proxy for the genital orgasm (Mentzos 2009), or, in other words, as described by the Hungarian psychoanalyst S. Radó, drug intakes induce a "pharmacogen orgasm" (Chessick 1960; Radó 1926).

Other authors, for instance, D. Hartmann, described a regression to or in some cases a fixation on the oral phase of psychic development. Hence, the drug serves as a symbolic representation of mother's milk (Hartmann 1969). This is in accordance with the observation that in some ecstatic states, the individual totally withdraws from external objects, as described by the (object relationship theory oriented) psychoanalyst Rosenfeld (1960). In addition, Hartmann (1969) observed that sexual activities of adolescent drug addicts were predominantly restricted to autoerotic and masturbatic behaviors. There are, however, also opposite phenomena, as, for example, sexual disinhibition after alcohol intake (Rosenfeld 1960) (Fig. 20.1).

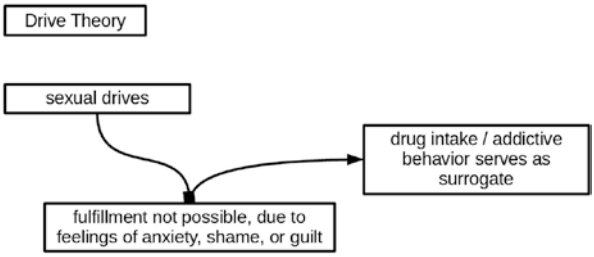

Fig. 20.1 Formation of addictive disorders from a drive theory perspective

20.3.5 Ego Psychology

From an ego-psychological point of view, addictive behavior is the only way possible for a structurally dysfunctional ego to achieve a minimum level of psychic stability. The Swiss-American psychoanalyst Wurmser (1997) described this as a dysfunctional symbolization ("hyposymbolization"): addictive patients often lack the ability to meaningfully articulate significant feelings. These are then instead expressed in the form of somatic complaints, bodily unease, or social accuses.

Different ego-psychological authors stress that it is not the desire for pleasant affective states but rather the desire to mitigate unbearable tensions that drives addictive behavior (Hartmann 1969; Rost 2001; Savitt 1963). Due to a structural weakness of the ego, these patients can mitigate these tension states only by referring to drugs (Hildebrandt 2007; Rosenfeld 1960).

In view of Radó (1933), addicted patients suffer from deficits in their self-care development and are incapable to autonomously stabilize the self-esteem. They are thus sensitive to frustrations which can induce agonizing states of "anxiety depressions." According to the German psychoanalyst Rost (2001), these anxiety-depression states resemble a primitive affect ("Ur-Affekt"), which is comparable with infantine death anxiety. Since these affective states are experienced as unbearable, patients will try everything to get rid of them. If—in this situation—a patient experiences (often by accident) that a certain behavior (e.g., shopping, browsing the Internet, drinking alcohol) leads to an alleviation of these unpleasant affective states, there is a risk that this person will turn to this behavior more frequently in the future (which is homologous to instrumental learning). The addictive behavior thus takes the place of self-care. What follows is a retreat from reality: psychic well-being is not achieved by dealing with demands of the "real" external world but instead by substance intake or addictive behaviors. Since these are much more simple and faster than arranging with issues of the real world, they often feel "magical."

Similarly, Wurmser (1997) views addictive behavior as a possibility to artificially defend against overwhelmingly unpleasant effects of loneliness, void, disillusionment, and anger. Wurmser then turns to defects of the superego and conceptualizes addictive disorders as a "turning syndrome"

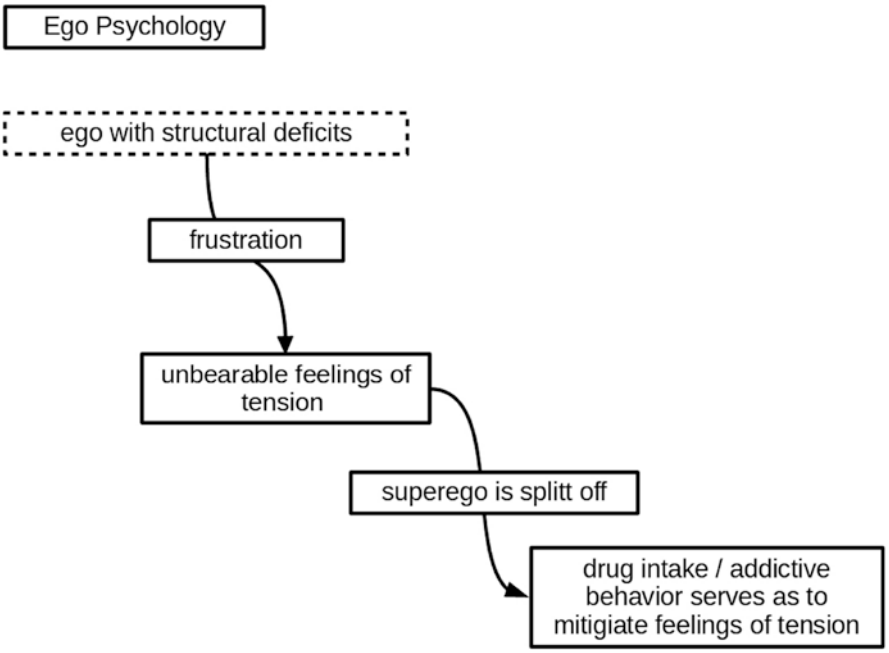

Fig. 20.2 Formation of addictive disorders from an ego-psychological perspective

("Kehrtwende-Syndrom"): addicted patients predominantly tend to use the defense mechanism splitting in order to achieve emotional stability. According to Wurmser, splitting describes a complex but unstable defense construct which combines the defense mechanisms repression, abnegation, regression, projection, externalization, and dissociation. Within one moment, mature superego functions (including a functioning conscience, ideals, and responsibility) deteriorate. The superego collapses and cannot control the addictive behavior any longer. The mature superego is replaced by a more primitive one, which tolerates the self-destructiveness of the addictive behavior and sometimes even appreciates it as a means of self-punishment.

The important role of superego defects in the development of addictive disorders is further emphasized by several other authors. Freud wrote about a pleasant disinhibition due to the shutdown of superego commandments caused by drug intake (Freud 1905). In addition, Rost (2001) stresses the role of superego defects in addicted patients and quotes the famous statement: "The super-ego can be dissolved in alcohol."

A very different point of view takes Wernado et al. (2006) by focusing on the effect of psychotropic substances on ego functions such as affect tolerance, affect control, tolerance toward frustrations, impulse control, the capability to anticipate, or the capability to judge. In the course of an addictive development, it does not seldomly happen that these ego functions do not serve the ego anymore but are rather subjected to assure substance intake (e.g., acquisition, consumption, Fig. 20.2).

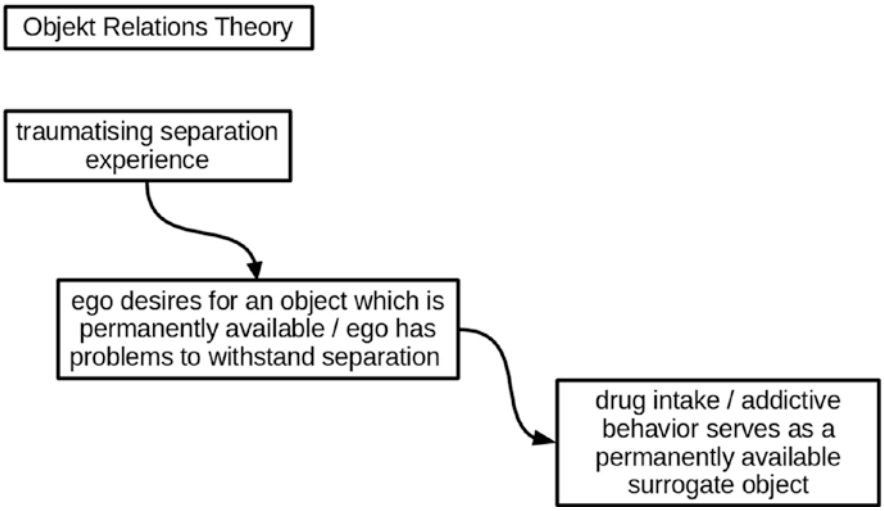

Fig. 20.3 Formation of addictive disorders from an object relations theoretical perspective

20.3.6 Object Relations Theory

Within the school of object relations theory, addictive behavior is seen as a surrogate object, which is permanently available. At this, addictive behavior is often installed to avoid painful feelings of separateness. Rosenfeld (1960) hypothesizes that drug intake represents on an unconscious level the attempt to incorporate a deceased object. D. Hartmann, when working with drug-addicted adolescents, was able to show that one of them indeed had lost a parent (Hartmann 1969). The drug thus serves as a substitute for a human object. While a real human object has limited abilities and follows own interests, however, the drug is permanently present and freely available (Wernado et al. 2006). Wurmser (1997) describes that sedating drugs (such as opioids or alcohol) act as a "motherly claustrum" (i.e., as the fantasized mother's womb) which is on the one hand desired (in terms of a "claustrophilia") and on the other hand feared (in the sense of a "claustrophobia", Fig. 20.3).

20.3.7 Self Psychology

From a self-psychological view, unempathic relationships between a child and his caregiver can lead to deficits in the cohesion, strength, and harmony of the child's self (Kohut 1975; Wolf 1998). Drug consumption or addictive activities can then serve as a means to stabilize a chronic instable self (Wurmser 1997). This stabilization by drug intake or addictive behaviors, however, is short termed. It is followed by feelings of shame and guilt, which lead to a renewed destabilization of the self. To emphasize this twofold effect, the German psychoanalyst W. Milch introduced the expression "pathological self-object" in order to differentiate it from original self-object (e.g., empathic relationships) (Milch 2001).

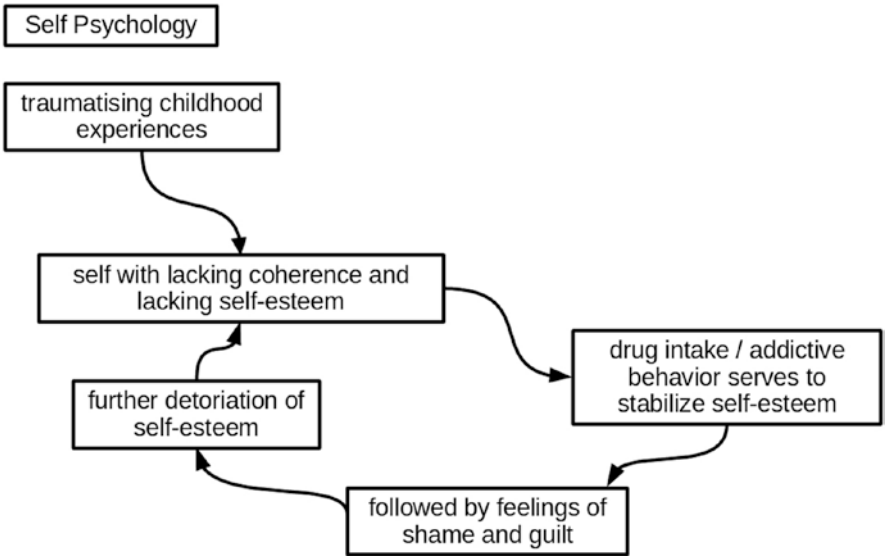

Fig. 20.4 Formation of addictive disorders from a self-psychological perspective

Wurmser (1997) conceptualizes a vicious circle of a narcissistic breakdown, which underlies addictive behavior: a disappointment or frustration leads to intense, uncontrollable feelings of anger, shame, and desperation. These feelings turn into a vague, unbearable tension, which induces a "desire for relief." An irrepressible urge to act is the consequence, which leads to aggressions against one's self and others. This is followed by a split-off of the superego (a "global denial of all superego contents"), which renders the superego temporarily meaningless. Eventually, the drug is lustfully consumed. The consumption is followed, however, by renewed feelings of disappointment, shame, and guilt (Fig. 20.4).

20.4 Case Report: Mr. J. (26 Years): Part 3

20.4.1 Biographical Background

When interviewed about significant biographical events, Mr. J. came to speak about an episode which he experienced in his childhood. Mr. J.'s parents separated when he was 9 years due to his father's extramarital affair. Mr. J. remembered to have taken site for his mother and stayed with her after the separation, while he felt strong feelings of anger and hate toward his father. To Mr. J.'s surprise, however, his parents reunited 2 years later. Besides being surprised, Mr. J. wasn't able to bring back his emotions connected to this incident. In the course of his psychotherapy, however, Mr. J. was able to elaborate that he experienced not only the separation of his parents but also their reunion as painful rejections.

20.4.2 Neurobiological Underpinnings

The dopaminergic reward system—key system of all addictive disorders—leads to profound alterations of subjective experience and behavior. Addictive activities dominate the patient's motivations and cognitions nearly completely. Besides the addictive behavior, there is nothing left to be enjoyed. In healthy individuals, the dopaminergic reward system induces behavioral patterns which serve two purposes: to preserve the organism itself and to preserve its species. For instance, the search for water and nutritious food, relationships, and sexual contacts are initiated and rewarded by the dopaminergic reward system (Frank et al. 2010; Goldstone et al. 2009; Hollmann et al. 2013; Kringelbach et al. 2003; Simmons et al. 2005; Stoléru et al. 2012; Wang et al. 2004). The dopaminergic reward system, however, also plays a key role in the development of addictive disorders. All substances which can lead to addiction have a key feature in common, which is their ability to activate the reward system without having any evolutionary or self-preservatory advantages (Di Chiara and Bassareo 2007; Heinz et al. 2004; Robbins and Everitt 1999; Wise 1996; Wise and Bozarth 1987). Drug consumption thus induces a feeling of desire for renewed intake as if the organism had eaten a nutritious food in a state of hunger or as if he had something similar essential for the preservation of his self or his species.

20.4.3 Important Components of the Reward System

Important components of the reward system include the ventral tegmental area, the ventral striatum which contains the nucleus accumbens, the ventral pallidum, the amygdala, the prefrontal cortex, the orbitofrontal cortex, and the insular cortex (Berridge and Robinson 2003). The ventral tegmental area is the origin of the dopaminergic reward system. Here is the location of dopaminergic neurons that send their axons to the ventral striatum and thus can activate this region. The main purpose of the ventral tegmental area is to influence the organism's behavior, so that actions, which had led to a result which was better than expected (positive prediction error), will be repeated more frequently in the future (Bayer and Glimcher 2005). The ventral striatum and the nucleus accumbens contain two distinguishable sets of neurons: neurons which are activated by dopaminergic stimulation from the ventral tegmental area lead to motivation for specific actions (which corresponds to the feeling of "wanting"), while neurons which are under the influence of opioid neurotransmission lead to affective pleasure (which corresponds to the feeling of "liking"; Berridge and Robinson 2003). The ventral pallidum is involved in these motivational and affective processes similar to the ventral striatum (Berridge and Robinson 2003; Cromwell and Berridge 1993). The amygdala plays an important role in the emotional evaluation of relevant stimuli, which are important for survival or species preservation. It is essential in attributing salience to important stimuli (Berridge and Robinson 2003; Grüsser and Thalemann 2006). Neurons of the prefrontal cortex, which send their

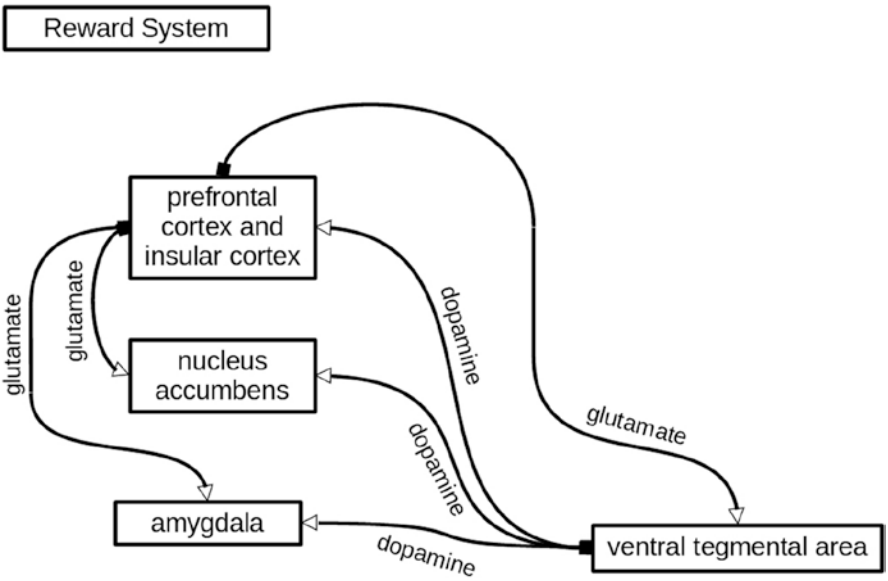

Fig. 20.5 Key structures of the reward system (simplified after Berridge and Robinson 2003)

activating axons to the ventral tegmental area, also play an important role (Karreman and Moghaddam 1996). The prefrontal cortex is important for the development of long-term motivations and aims. By a positive evaluation of the actual situation with regard to long-term aims, it can induce a tonic baseline activity in the ventral tegmental area and ventral striatum (Davey et al. 2008). Artificial stimulation of the prefrontal cortex of alcohol-addicted patients with transcranial direct current stimulation leads to reduced craving for alcohol (Boggio et al. 2008). Similar results were obtained with transcranial magnetic stimulation in cocaine-addicted patients: again the stimulation of prefrontal cortex led to reduced craving for cocaine (Camprodon et al. 2007). The orbitofrontal cortex and insular cortex are important to estimate the reward value of a stimulus. For this stored similar experiences have to be evaluated (Berridge and Robinson 2003; Grüsser and Thalemann 2006) (Fig. 20.5).

20.4.4 The Function of the Reward System in a Nutshell

The following sketch may illustrate the functions of different reward structures:

A hungry girl decides to climb an apple tree to pick an apple. She clambers the tree and chooses an apple which shines particularly red. Since the apple tastes better than expected, the girl concludes to look out for red apples more often.

The decision to climb on the tree is made in the prefrontal and orbitofrontal cortices. Here are memories stored, regarding worthwhile previous ventures to pick an apple. The insular cortex has memories about the delicious taste of apples. Prefrontal

and insular cortices activate the ventral tegmental area, which in turn activates the ventral striatum using its dopaminergic neurons. The dopaminergic activity in the ventral striatum induces the actual motivation to climb on the tree. It makes the girl wanting to eat the apple. The ventral striatum is also responsible to convert the decision into action, i.e., it induces and maintains goal-directed actions. The consumption of the apple, which is more delicious than expected, also leads to increased activity in the ventral striatum, this time however induced by opioid neurotransmission, which makes the girl to like the apple. Also the orbitofrontal cortex gets activated by the positive tasty experience, which will increase the probability that the girl will look for red apple in the future. In other words, what is liked will be more frequently wanted (Berridge 2003; Berridge and Robinson 2003; Cardinal et al. 2002; Grüsser and Thalemann 2006).

20.4.5 Neurobiological Alterations in Addiction

Inherited or acquired alterations of activity of the reward system lead to an increased risk for addictive disorders. For instance, Volkow et al. (2006) were able to show that a high dopamine D2 receptor availability protects against alcoholism in individuals who had a high inherited risk to develop alcohol addiction. This finding is confirmed by animal studies which were able to show that high dopamine D2 receptor availability leads to reduced alcohol consumption (McBride et al. 1993; Stefanini et al. 1992). In addition, patients suffering from alcohol addiction or Internet addiction had a reduced availability of dopamine D2 receptors in the ventral striatum (Heinz et al. 2004; Kim et al. 2011; Martinez et al. 2005).

Animal experiments show that organisms try to maintain a homeostatic baseline level of dopamine in the ventral striatum (Hoebel et al. 1983; Robbins and Everitt 1999). It is thus hypothesized that in healthy humans, this homeostatic baseline activity can be achieved by weak reinforcers found in everyday life (e.g., tasty foods or joyful relationships). If, however, an individual has inherited a decreased dopamine activity, there is a high risk that this individual may turn to stronger dopamine activators (such as drugs or addictive behaviors) to achieve a sufficient baseline activity (Reuter et al. 2005; Robbins and Everitt 1999).

If an addictive disorder has come into existence, the situation gets more complicated though, since the organism reacts to the high load of dopamine with a downregulation of its receptors. This is the reason why in the course of an addictive development, increasing doses are needed to reach the same effect. If the substance of abuse or the addictive behavior is omitted, the organism finds itself in a situation which is even worse compared to before the development of the addiction. Since the reward system has downregulated its responsiveness, it is now harder than before, to maintain a sufficient homeostatic baseline dopamine activity by relying on natural reinforcers (such as food or relationships; Robbins and Everitt 1999; Rossetti et al. 1992). This was shown in a study investigating detoxified alcoholics: when compared to healthy control subjects, the ventral striatum of detoxified alcoholics showed reduced activity when they expected or received a reward (Beck et al. 2009, Fig. 20.6).

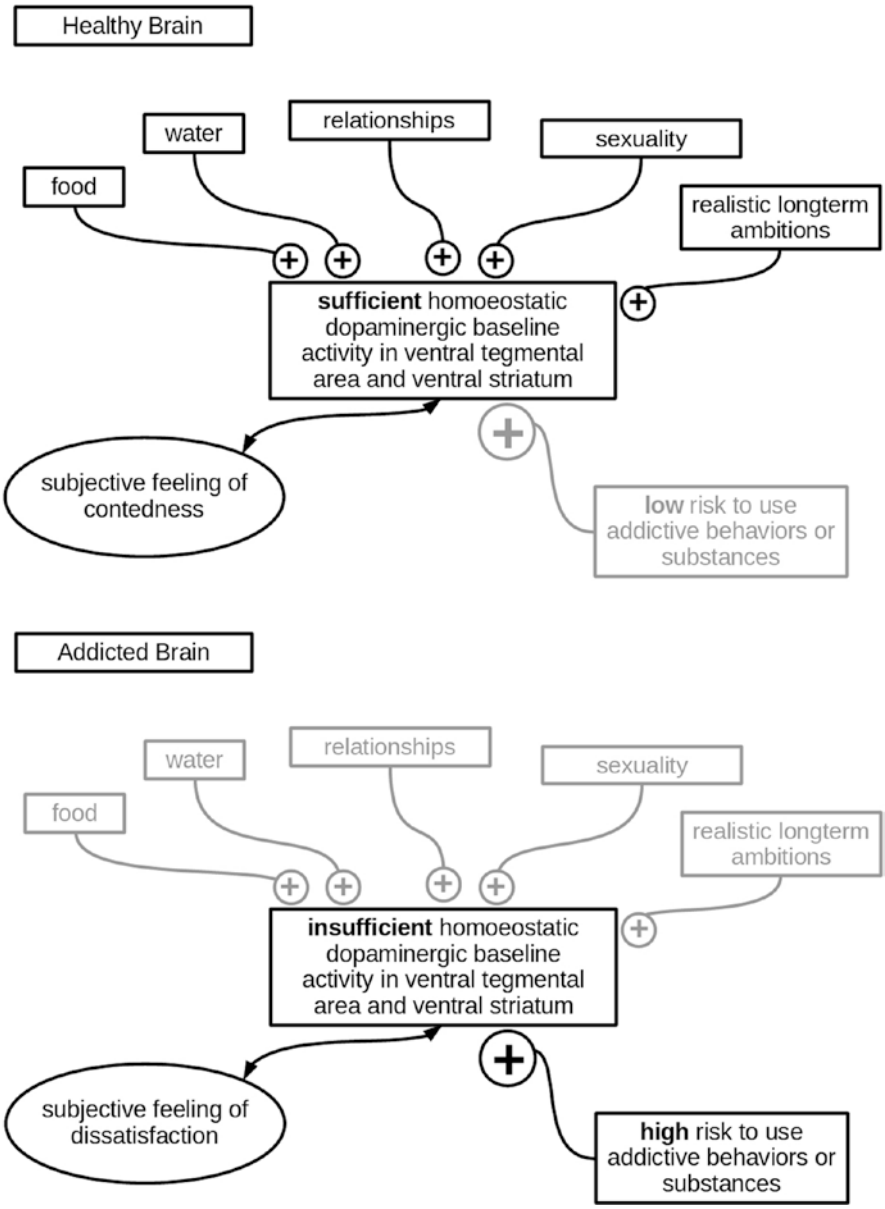

Fig. 20.6 The healthy brain is able to maintain a sufficient baseline activity in its ventral tegmental area and ventral striatum by relying on weak dopamine activators such as food, water, relationships, sexuality, or realistic long-term ambitions. This corresponds to the subjective feeling of general contentedness. The healthy brain is comparatively safe to withstand strong dopamine activators such as addictive behaviors or drugs

The addicted brain, however, is not able to maintain a sufficient baseline activity in its reward system by weak reinforcers. This may be due to inherited alterations of the dopamine D2 receptors or the consequence of a downregulation of the reward system due to addictive dopaminergic overstimulation. This corresponds to the subjective feeling of general dissatisfaction. As a consequence, there is a high risk to rely on strong dopamine activators such as addictive behaviors or drugs to achieve a homeostatic baseline activity.

20.4.6 Psychopharmacological Approaches to Addiction

As recent psychopharmacological studies with addicted patients have shown, there are two promising medications available in the treatment of addictive disorders: naltrexone and acamprosate.

Naltrexone is an opioid antagonist which blocks the opioid-induced activation of the reward system. Thus, the hedonic components of drug abuse are reduced and the positive prediction error is getting smaller, which will decrease the frequency of drug consumption in the future. As studies have shown, naltrexone is able to reduce the number of alcohol relapses significantly (Rösner et al. 2008; Srisurapanont and Jarusuraisin 2005).

In addition, the putative glutamate antagonist acamprosate is able to reduce alcohol relapses significantly (Rösner et al. 2008).

20.4.7 Neuropsychodynamic of Addiction

Psychodynamic and neurobiological concepts of addiction show a manifold overlap.

With regard to drive theory concepts, the urge for food or sexuality can indeed be compared with addictive craving, since both are neurobiologically mediated by reward activity (Di Chiara and Bassareo 2007; Frank et al. 2010; Goldstone et al. 2009; Heinz et al. 2004; Hollmann et al. 2013; Kringelbach et al. 2003; Robbins and Everitt 1999; Simmons et al. 2005; Stoléru et al. 2012; Wang et al. 2004; Wise 1996).

In addition, ego-psychological theories correlate with neurobiological findings. For instance, many drugs are capable to mitigate states of anxiety. For example, alcohol and benzodiazepines can modulate the GABA-A receptor, which leads to reduced anxiety (Benkert and Hippius 2010).

With regard to object relations theory, a similar mechanism exists, since endogenous opioids play an important role in the hedonic interactions. As was shown in a study investigating rats, social interactions led to endogenous brain opioid release (Panksepp and Bishop 1981). A lack of rewarding social interactions may thus lead to a higher risk to consume opioids in order to maintain a homeostatic baseline level.

From a self-psychological view, there is an overlap between the concept of an incoherent self (i.e., a self-state dominated by feelings of insecurity, lack of self-esteem, lack of self-calming capabilities, and a lack of realistic aims) and a state of chronically reduced baseline dopamine activity. The prefrontal cortex may play an important role at this, since the prefrontal cortex can induce a tonic baseline activity in the reward system, when the individuum feels itself in congruence with long-term goals and interests (e.g., aims concerning relationships or one's career; Davey et al. 2008).

20.4.8 Neuropsychodynamically Informed Implications for the Treatment of Addictive Disorders

Elaborating on suggestions made by Volkow et al. (2004), a neuropsychodynamically informed therapeutic approach should be based on the following components:

- Psychotherapeutic interventions should focus on (pleasant) social interactions since these have a direct influence on baseline dopamine activity in reward regions. For instance, it might be helpful to encourage addicted patients to reactivate friendships or join social sports or other social activities.
- In addition, the psychotherapeutic work should focus on the patient's goals and ambitions. Often, addicted patients have difficulties to describe these or even have lost them in the course of their addictive history. Often it takes time to newly define them. Emphasis should be put on the development of realistic goals and ambitions, since these may lead to a higher baseline dopamine activity and can thus decrease the needs for additional (artificial) dopamine activators such as drugs or addictive behaviors.
- Drug consumption leads to reward activity (and the correlating feelings of pleasure) on the short term but increases unpleasant feelings of guilt and shame on the long term. Thus, psychotherapeutic interventions, which increase self-control in this view, would be beneficial.
- Psychodynamic biographic work may include approaches to identify traumatic experiences, in which the patient felt separated, alone, or lost. If these memories are unconscious, the patient may improve, when they are brought to consciousness, since the patient can then deal with these memories (and similar events which might occur to him in his everyday life) in a more adequate way. Relevant for the patient and his symptoms is the subjectively experienced extent of separation or social exclusion, which may differ from his objectively observable reality. For instance, Mr. J. had stable contact to his mother and father; however, subjectively he still felt painfully excluded and separated.
- In cases of more severe addictions with frequent relapses, one might also consider to prescribe drugs which modulate the dopamine system or can decrease craving (e.g., naltrexone and acamprosate).

20.5 Case Report: Mr. J. (26 Years): Part 4

20.5.1 Therapy

At the start of his psychotherapy, an arrangement was made that Mr. J. would take notes about his Internet activities (i.e., how much time per day he spent on which websites) and his urges to browse the Internet. His records were then evaluated once a week. While it was unclear to Mr. J. what was behind his urgent needs to surf the Internet at the beginning of his treatment, this got more obvious during the course of his therapy. When his weekly records were evaluated together with Mr. J., he learned that in particular situations, what Mr. J. experienced as social rejection led to increased needs to join the Internet. For instance, Mr. J. felt a strong desire to surf the Internet and eventually gave in to that need, after a fellow student canceled an appointment with him. At the beginning of his treatment, Mr. J. wasn't even aware that he was sensitive to situations like this. After Mr. J. had learned about this connection, however, he was able to deal with such situations in a different way. For example, Mr. J. assured himself if appointments would take place or not.

In the course of his treatment, psychodynamic connections could be made between his actual behavior (i.e., his uncontrollable urges to browse the Internet triggered by situations that were experienced as rejection) and traumatic childhood experiences: Mr. J.'s parents separated when he was 9 years due to his father's extramarital affair. They later reunited, however, which was very surprising for Mr. J. Subjectively, Mr. J. felt and experienced both situations, the separation of his parents and their surprising reunion, as painful exclusion. Since Mr. J. felt helpless in both situations, however, Mr. J. repressed the hurtful feelings of pain, sadness, and anger about the perceived rejection. As a consequence, Mr. J. had difficulties to deal with similar situations in his later life. His Internet addiction (i.e., the search for exciting content and interesting websites) helped him to avoid the painful feelings triggered by these situations.

During the course of his therapy, however, Mr. J. observed reduced needs to surf the Internet, and his records showed that his average Internet time decreased significantly. Reasons for this included that Mr. J. was more aware about his behavior, trigger situations, and the psychodynamic connections. In addition, Mr. J. began to change his free time activities; for instance, he took part in sporting activities again.

References

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. Arlington: American Psychiatric Association; 2013.

Andreassen CS, Torsheim T, Brunborg GS, Pallesen S. Development of a Facebook addiction scale. Psychol Rep. 2012;110(2):501–17.

Bayer HM, Glimcher PW. Midbrain dopamine neurons encode a quantitative reward prediction error signal. Neuron. 2005;47(1):129–41.

Beck A, Schlagenhauf F, Wüstenberg T, Hein J, Kienast T, Kahnt T, Schmack K, Hägele C, Knutson B, Heinz A, Wrase J. Ventral striatal activation during reward anticipation correlates with impulsivity in alcoholics. Biol Psychiatry. 2009;66(8):734–42.

Benkert O, Hippius H. Kompendium der Psychiatrischen Pharmakotherapie. 8th ed. Heidelberg: Springer; 2010.
Berridge KC. Pleasures of the brain. Brain Cogn. 2003;52(1):106–28.
Berridge KC, Robinson TE. Parsing reward. Trends Neurosci. 2003;26(9):507–13.
Boggio PS, Sultani N, Fecteau S, Merabet L, Mecca T, Pascual-Leone A, Basaglia A, Fregni F. Prefrontal cortex modulation using transcranial dc stimulation reduces alcohol craving: a double-blind, sham-controlled study. Drug Alcohol Depend. 2008;92(1-3):55–60.
Camprodon JA, Martínez-Raga J, Alonso-Alonso M, Shih MC, Pascual-Leone A. One session of high frequency repetitive transcranial magnetic stimulation (rtms) to the right prefrontal cortex transiently reduces cocaine craving. Drug Alcohol Depend. 2007;86(1):91–4.
Cardinal RN, Parkinson JA, Hall J, Everitt BJ. Emotion and motivation: the role of the amygdala, ventral striatum, and prefrontal cortex. Neurosci Biobehav Rev. 2002;26(3):321–52.
Chessick RD. The pharmacogenic orgasm ïn the drug addict. Arch Gen Psychiatry. 1960;3:545–56.
Cromwell HC, Berridge KC. Where does damage lead to enhanced food aversion: the ventral pallidum/substantia innominata or lateral hypothalamus? Brain Res. 1993;624(1-2):1–10.
Davey CG, Yücel M, Allen NB. The emergence of depression in adolescence: development of the prefrontal cortex and the representation of reward. Neurosci Biobehav Rev. 2008;32(1):1–19.
Di Chiara G, Bassareo V. Reward system and addiction: what dopamine does and doesn't do. Curr Opin Pharmacol. 2007;7(1):69–76.
Frank S, Laharnar N, Kullmann S, Veit R, Canova C, Hegner YL, Fritsche A, Preissl H. Processing of food pictures: influence of hunger, gender and calorie content. Brain Res. 2010;1350:159–66.
Freud S. Der Witz und seine Beziehung zum Unbewussten. Frankfurt: S. Fischer; 1905.
Freud S. Aus den Anfängen der Psychoanalyse - Briefe an Wilhelm Fließ. Abhandlungen und Notizen aus den Jahren 1887-1902. S. Fischer: Frankfurt; 1962.
Goldstone AP, Prechtl de Hernandez CG, Beaver JD, Muhammed K, Croese C, Bell G, Durighel G, Hughes E, Waldman AD, Frost G, Bell JD. Fasting biases brain reward systems towards high-calorie foods. Eur J Neurosci. 2009;30(8):1625–35.
Griffiths M. A 'components' model of addiction within a biopsychosocial framework. J Subst Use. 2005;10(4):191–7.
Grüsser SM, Thalemann CN. Verhaltenssucht. 1st ed. Bern: Verlag Hans Huber; 2006.
Hartmann D. A study of drug-taking adolescents. Psychoanal Study Child. 1969;24:384398.
Heinz A, Siessmeier T, Wrase J, Hermann D, Klein S, Grüsser SM, Grüsser-Sinopoli SM, Flor H, Braus DF, Buchholz HG, Gründer G, Schreckenberger M, Smolka MN, Rösch F, Mann K, Bartenstein P. Correlation between dopamine d(2) receptors in the ventral striatum and central processing of alcohol cues and craving. Am J Psychiatry. 2004;161(10):1783–9.
Hildebrandt HA. Psychoanalyse der sucht - eine kritische bilanz. Psychoanalyse Widerspruch 36; 2007.
Hoebel BG, Monaco AP, Hernandez L, Aulisi EF, Stanley BG, Lenard L. Self-injection of amphetamine directly into the brain. Psychopharmacology. 1983;81(2):158–63.
Hollmann M, Pleger B, Villringer A, Horstmann A. Brain imaging in the context of food perception and eating. Curr Opin Lipidol. 2013;24(1):18–24.
Karreman M, Moghaddam B. The prefrontal cortex regulates the basal release of dopamine in the limbic striatum: an effect mediated by ventral tegmental area. J Neurochem. 1996;66(2):589–98.
Kim SH, Baik SH, Park CS, Kim SJ, Choi SW, Kim SE. Reduced striatal dopamine d2 receptors in people with internet addiction. Neuroreport. 2011;22(8):407–11.
Kohut H. Narzissmus: eine Theorie der psychoanalytischen Behandlung narzisstischer Persönlichkeitsstörungen. Frankfurt am Main: Suhrkamp; 1975.
Kringelbach ML, O'Doherty J, Rolls ET, Andrews C. Activation of the human orbitofrontal cortex to a liquid food stimulus is correlated with its subjective pleasantness. Cereb Cortex. 2003;13(10):1064–71.
Martinez D, Gil R, Slifstein M, Hwang DR, Huang Y, Perez A, Kegeles L, Talbot P, Evans S, Krystal J, Laruelle M, Abi-Dargham A. Alcohol dependence is associated with blunted dopamine transmission in the ventral striatum. Biol Psychiatry. 2005;58(10):779–86.
McBride WJ, Chernet E, Dyr W, Lumeng L, Li TK. Densities of dopamine d2 receptors are reduced in cns regions of alcohol-preferring p rats. Alcohol. 1993;10(5):387–90.

Mentzos S. Textbook of psychodynamics. The function of dysfunctionality of psychic disorders. (German: Lehrbuch der Psychodynamik. Die Funktion der Dysfunktionalität psychischer Störungen.). 2nd ed. Göttingen: Vandenhock und Ruprecht; 2009.
Milch W. Lehrbuch der Selbstpsychologie. Stuttgart: Verlag W. Kohlhammer; 2001.
Panksepp J, Bishop P. An autoradiographic map of (3h)diprenorphine binding in rat brain: effects of social interaction. Brain Res Bull. 1981;7(4):405–10.
Pine F. The four psychologies of psychoanalysis and their place in clinical work. J Am Psychoanal Assn. 1988;36:571–96.
Radó S. The psychic effects of intoxicants: an attempt to evolve a psycho-analytical theory of morbid cravings. Int J Psychoanal. 1926;7:396–413.
Radó S. The psychoanalysis of pharmacothymia (drug addiction). Psychoanal Q. 1933;2:1–23.
Reuter J, Raedler T, Rose M, Hand I, Gläscher J, Büchel C. Pathological gambling is linked to reduced activation of the mesolimbic reward system. Nat Neurosci. 2005;8(2):147–8.
Robbins TW, Everitt BJ. Drug addiction: bad habits add up. Nature. 1999;398(6728):567–70.
Rosenfeld HA. On drug addiction. Int J Psychoanal. 1960;41:467–75.
Rösner S, Leucht S, Lehert P, Soyka M. Acamprosate supports abstinence, naltrexone prevents excessive drinking: evidence from a meta-analysis with unreported outcomes. J Psychopharmacol. 2008;22(1):11–23.
Rossetti ZL, Melis F, Carboni S, Gessa GL. Dramatic depletion of mesolimbic extracellular dopamine after withdrawal from morphine, alcohol or cocaine: a common neurochemical substrate for drug dependence. Ann N Y Acad Sci. 1992;654:513–6.
Rost WD. Psychoanalyse des Alkoholismus. In: Theorie, diagnostik, Behandlung. 6th ed. Stuttgart: Klett-Cotta; 2001.
Savitt RA. Psychoanalytic studies on addiction: Ego structure in narcotic addiction. Psychoanal Q. 1963;32:43–57.
Simmons WK, Martin A, Barsalou LW. Pictures of appetizing foods activate gustatory cortices for taste and reward. Cereb Cortex. 2005;15(10):1602–8.
Srisurapanont M, Jarusuraisin N. Opioid antagonists for alcohol dependence. Cochrane Database Syst Rev. 2005;12:CD001867.
Stefanini E, Frau M, Garau MG, Garau B, Fadda F, Gessa GL. Alcohol-preferring rats have fewer dopamine d2 receptors in the limbic system. Alcohol Alcohol. 1992;27(2):127–30.
Stoléru S, Fonteille V, Cornélis C, Joyal C, Moulier V. Functional neuroimaging studies of sexual arousal and orgasm in healthy men and women: a review and meta-analysis. Neurosci Biobehav Rev. 2012;36(6):1481–509.
Subkowski P. Störungen der Trieborganisation in Suchtentwicklungen. In: Psychodynamik der Sucht: Psychoanalytische Beiträge zur Theorie. Göttingen: Vandenhoeck & Rupprecht; 2008. p. 51–90.
Volkow ND, Fowler JS, Wang GJ. The addicted human brain viewed in the light of imaging studies: brain circuits and treatment strategies. Neuropharmacology. 2004;47(Suppl 1):3–13.
Volkow ND, Wang GJ, Begleiter H, Porjesz B, Fowler JS, Telang F, Wong C, Ma Y, Logan J, Goldstein R, Alexoff D, Thanos PK. High levels of dopamine d2 receptors in unaffected members of alcoholic families: possible protective factors. Arch Gen Psychiatry. 2006;63(9):999–1008.
Wang GJ, Volkow ND, Telang F, Jayne M, Ma J, Rao M, Zhu W, Wong CT, Pappas NR, Geliebter A, Fowler JS. Exposure to appetitive food stimuli markedly activates the human brain. NeuroImage. 2004;21(4):1790–7.
Wernado M, Blaufuß J, Jacob A, Kannenberg S. Spezifische Interventionen auf der Basis der analytischen/analytisch orientierten Therapie bei psychischen Störungen im Zusammenhang mit psychotropen Substanzen. In: Lehrbuch der Psychotherapie: 2 Psychoanalytische und tiefenpsychologisch fundierte Therapie. 3rd ed. München: CIP-Medien; 2006. p. 97–108.
Wise RA. Neurobiology of addiction. Curr Opin Neurobiol. 1996;6(2):243–51.
Wise RA, Bozarth MA. A psychomotor stimulant theory of addiction. Psychol Rev. 1987;94(4):469–92.
Wolf ES. Theorie und Praxis der psychoanalytischen Selbstpsychologie. Frankfurt: Suhrkamp; 1998.
Wurmser L, editor. Die verborgene Dimension. Göttingen: Vandenhoeck & Ruprecht; 1997.