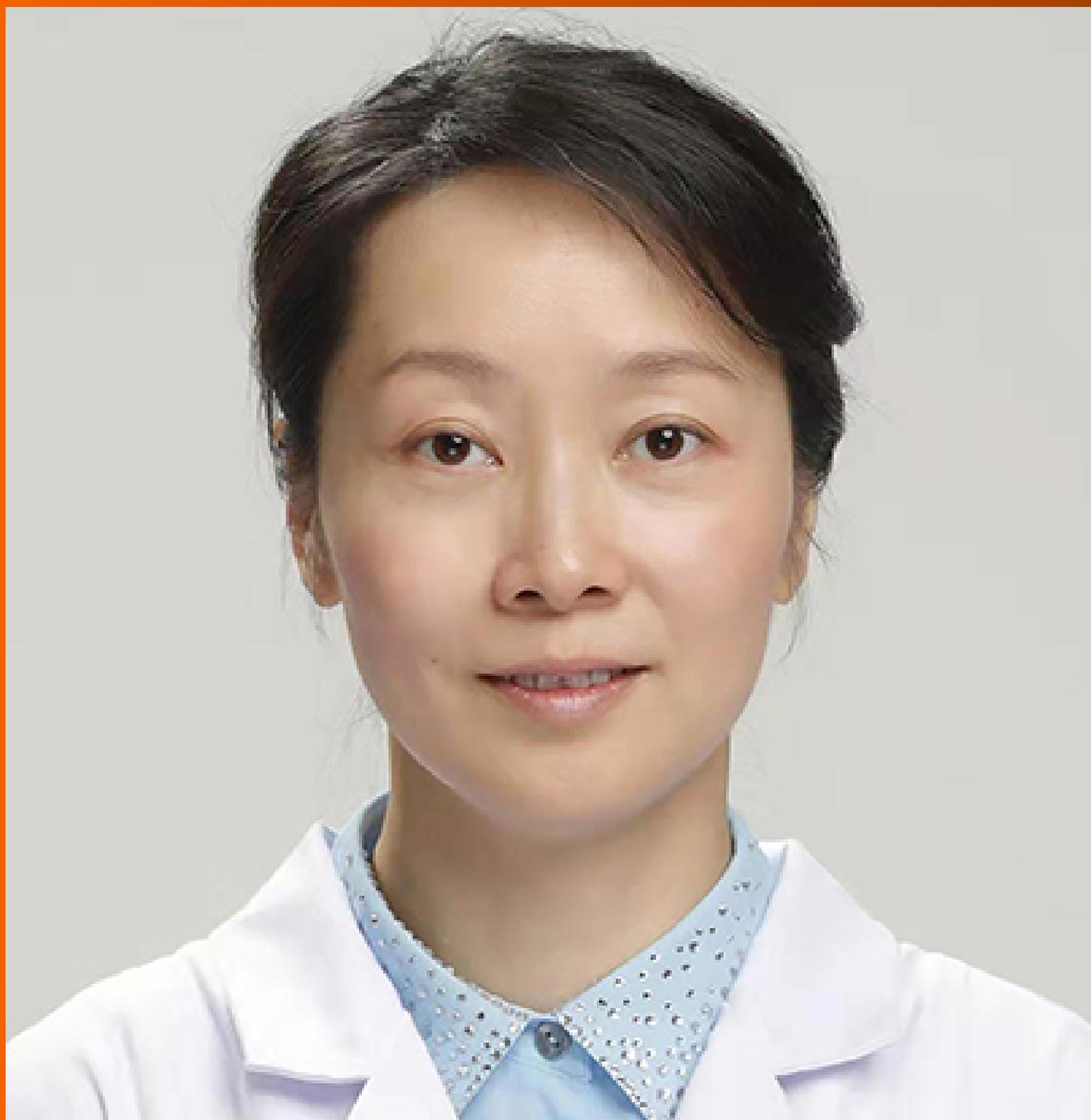


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## How does the ‘environment’ come to the person? The ‘ecology of the person’ and addiction

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### Abstract

Currently, psychiatry lacks a field that can be called “theoretical psychiatry”, which uses theoretical concepts and explanatory models: The main stream of research is to collect data of all kinds in the hope that the computational Big Data approach will shed a bright light on the black box of mental disorders. Accordingly, the biology-based Research Domain Criteria of the National Institute of Mental Health have been established. However, as philosophical analyses of concepts and methods have shown, several epistemological gaps stand in the way of a consistent multilevel understanding of mental disorders. Also, the implicit ontological problems in the biological reduction of the psychosocial level and in the integration of so-called hard and soft disciplines are mostly left out. As a consequence, a non-reductive psychological theory of mental disorders is sought that also integrates correlating biological and sociological issues. In this context, one example of promising nonreductive psychiatric research is the option of systems/network psychopathology. The possibilities for integrating different psychological perspectives are highlighted for the field of addiction research and treatment, where pragmatic behaviorist approaches dominate over the theory-based practice of psychoanalysis. In comparing the theoretical constructs of these two approaches, the relevance of the concept of “(social) environment” as the wealth of influential sociocultural factors is discussed at levels superior to the interpersonal micro-level, namely the organizational meso- and societal macro level, which is not sufficiently considered in current biopsychiatry. On this basis of argumentation, the usefulness of grounding and framing psychiatry through the field of ecological sciences, especially human ecology, is demonstrated. Finally, to this end, an outline of an ecological model of mental health and illness is presented.

**Key Words:** Systems/network psychopathology; Theoretical psychiatry; Ecology of the person; Psychoanalytic object relations theory; Addiction; Mind; Resilience

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**Core Tip:** Similar to theoretical medicine, theoretical psychiatry and its engagement with systems/network psychopathology has a research gap, and so we shed light on the question of how the “social”, respectively the environment, manifests itself in the person. Using addiction as an example, we explore systems theoretical and psychoanalytic concepts to provide a framework for understanding the sociocultural, interpersonal, and human ecological factors that impact mental health and illness. This theoretical framework provides a way to understand conceptually and structure computer-collected Big Data. The fact that humans are “situated subjects” implies a broader view of a systemic ecology of the person to guide processes of change in mental health, whether for prevention or treatment.

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## INTRODUCTION

Nothing is as practical as a good theory[1].

### *Theory in psychiatry?*

The call for “theoretical psychiatry” is not often made, but it seems a useful, but challenging, task[2,3]. But what is a “theory”?

Even in the philosophy of science there is not much consensus about essential features of theories. Empiricists see theories as final stages of induction, while constructivists see even observations as a kind of theories. Here the hybrid Kantian position might be useful, which distinguishes between empirical and theoretical knowledge but claims that they are related. In this context, and with respect to applications in medicine/psychiatry, there are several descriptions of theories to consider: Theories can be characterized essentially as “because” answers to “why” questions that appeal to causal principles, such as in classical physics: The apple falls from the tree because of gravity, namely, reciprocal forces that are inherent in all objects and are supposed to be exchanged between them[4]. Applied to medicine/psychiatry this could mean: The disease arose because the person was exposed to stressors. Scientific theories are logically consistent statements about reality. Their central concepts must be clearly defined (“disease”) and should be supported by empirical data[5]. In this regard, theories are based on a set of empirically verified hypotheses, where hypotheses are mainly statements with an “if x, then y” or “the more x, the more y” structure. Hypotheses are inductions from empirical data and, once strongly confirmed, are called empirical laws and can be developed into a more complex construct (gravity) that requires and allows for further explanation. In medicine (and psychiatry), a hypothesis is very often already classified as a theory. However, hypotheses are not sufficient to understand complex phenomena such as health and disease, because confirmed empirical laws are only a basis of theories, which expand into highly formalized concepts, at least in physics and chemistry. Of course, as derived statements about reality, theories should be falsifiable and therefore must be “grounded” by observations and data, otherwise they are according to Karl Popper only immunized belief systems. Theories intend causal explanations and should thereby also the range of their validity: Isaac Newton’s theory of gravity is useful for everyday mechanics, but Albert Einstein’s relativistic theory of gravity also covers processes in the subatomic world.

In summary, and consistent with such global descriptions, theories can be understood as explanations, in particular, of new observations and data by “nomological deduction”, which also enable predictions, even if these are only probabilistic and not deterministic in character[6]. In short, theories enable the ordering of observations.

Although this metatheoretical conception of a theory has been questioned in philosophy of science, at least with respect to the relevance of principles (or laws) in biology, psychology and sociology (nomological explanations), mechanistic models can be a sufficient formulation of a theory[7]. In this context, the systems theory view, as we partially apply it here, has a paradigmatic epistemological position that refers to principles such as “dynamic equilibrium” and focuses on building testable models of networks and circuits[8-11].

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## THEORY IN PSYCHIATRY – ONLY A BIOLOGICAL REDUCTION WITHOUT INTEGRATION?

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Again, the call for a “theoretical psychiatry” is a challenging task[2,3] due to its complexity. Therefore, further elaboration is needed.

### ***Diversity of psychiatric “theories” – Different perspectives***

Within the description of theories and a brief review of the history of the scientific roots of psychiatry at the transition from the 19<sup>th</sup> to the 20<sup>th</sup> century, different approaches can be identified[12]: Kraepelin[13] emphasized experimental psychology in order to obtain more accurate data on mentally ill patients[13], while Jaspers[14] focused on the world of experiences with his influential phenomenological psychopathology. Another psychiatric giant of the times, Bleuler[15] had sympathies for the broader framework of psychoanalysis launched by Freud[16] and based on qualitative data and extensive theories[16].

After this period of more or less psychological approaches to mental disorders, the discovery of successful psychopharmaceutical approaches in the 1950s ushered in biological psychiatry, which continues to dominate psychiatric thinking today[17,18]. Also in the 1950s, social psychiatry began the scientific study of the social dimension of mental disorders leading, for example, to the discovery of class-specific inequality in the incidence of mental disorders[19]. However, the study and organization of health care was also increasingly a topic of social psychiatry[20]. In particular, international comparisons of epidemiology and culture-specific conceptions of mental health and health care demonstrated the need for cultural psychiatry[21].

In agreement with these main disciplinary directions of psychiatric research, it must be acknowledged that mental disorders as objects of knowledge in psychiatry are multidimensional phenomena, which - already for their differentiated description - require biological, psychological and sociological concepts and research methods, and which are in principle explained by the integrative bio-psycho-social model proposed by Engel[22] in the late 1970s. This model was intended to allow each individual mental disorder, such as addictions, to be represented within an integrative conceptual framework[23].

However, in the 1980s, and contrary to Engel’s suggestion, scientific psychiatry became increasingly one-dimensional through the extensive use of, of course valuable, (neuro) biological methods, data, and perspectives. As a result, sophisticated imaging techniques can be used in clinical research together with molecular biological tools that generate a huge amount of data, and new psychiatric drugs have also been developed. In line with this development, the book “Brave New Brain” in 2001 summarized the value of the biological approach in psychiatry as a strong programmatic perspective that is still growing and even dominating psychiatric thinking[24]. In terms of practical psychiatry, psychological techniques [e.g., cognitive behavioral therapy (CBT)][25] have been explored and added to pharmaceutical treatment. Planning and intervention in family and community relationships also became an important topic in multidimensional practical psychiatry.

Hypotheses were formulated at the theoretical level, derived from biological data and obtained using increasingly sophisticated technical methods. These hypotheses have been empirically tested, but almost no complex theoretical concepts have been developed that are “explanatory” in the strict sense. Mainly statistically based constructs like the “(individual’s) susceptibility to stress” were supposed to explain the variance in the data world[26]. However, as mentioned at the onset, such constructs are not theory in the sense of theory in the context of physics.

### ***Criteria for the research domain – an integrative framework?***

As a consequence of data, and technology-driven biological psychiatry based on the initial brief description of theory, we are currently confronted with an almost theory-

free psychiatry that wants to refer to data, hopefully Big Data[27]. This-critically speaking-empirical and biocentric complex research program was supposed to be integrated a few years ago by the conceptual framework of Research Domain Criteria (RDoC)[28]. RDoC essentially aims to integrate behavioral science and neuroscience into a matrix of five functional domains, namely social functions, cognitive functions, positive valence functions, negative valence functions, and basic regulatory functions described by different types of data such as genetics, molecules, cells, circuits, physiology, behavior, and even self-reports. This comprehensive approach promises more order in understanding the wealth of knowledge in psychiatry. It ultimately aims at a bioscience-based new taxonomy of diagnoses and thus stands in some contrast to the Diagnostic Statistical Manual[29] with its symptom-centered taxonomy of classical clinical psychiatry as used by clinicians.

One of the most impressive positive examples that fits well with RDoC is the neurobiology of addiction, which was developed before RDoC. Most notably, Koob and Le Moal[30], Koob[31], and Koob and Volkow[32] have stimulated theory development in addiction research through neurobiology[30-32]. For example, they consider the opposing functional organization of the reward system (nucleus accumbens) and the stress/punishment system (amygdala) and outline a stage-based concept that shifts from a brain center-oriented paradigm to a (“systemic”) neuro-network view. It also draws on the behavioral biology of addiction but is likely to be of limited use in clinical work. We will add to this approach in the second part of this paper.

In general, RDoC seems to favor “behavioristic psychology” over phenomenological approaches to psychological issues, especially psychopathology. Apparently, there is also a relevant epistemological gap between objective and detached psychiatric research in the laboratory (third person perspective), based on physiology and behavioral science, and subjective and interactive clinical observation and practice at the bedside, albeit standardized, based on self-reports (first and second person perspective). Some of these basic epistemological contradictions have already been discussed (*e.g.*, in relation to the interdisciplinary study of working memory[33] and also in relation to the foundations of RDoC)[34].

### ***Epistemological gaps – challenges for bridging concepts***

These philosophical (or metatheoretical) issues in psychiatry are rarely discussed and only by a few researchers[35-38]. Regarding the theoretical integration of knowledge, due to the multiplicity of methods that are used to study mind and brain[39,40], there are at least three main gaps that cannot be reduced by physicalism and cannot be captured by a non-reductive physicalism within an “integrative neuroscience”, since these multiple dimensions seem to be emergent properties of humans[41,42]: (1) Intradisciplinary integration in biological substrate research: The main problem of contemporary biology is related to the part-whole problem and implies that molecular biological knowledge cannot be easily linked to questions of whole-organism physiology: This problem also implies that data from physics and chemistry are difficult to combine. For example, there is no consistent theory of information processing of the synapse that relates electrical digital phenomena, such as spiking frequency of presynaptic neurons, to proportional transmitter release and analogous changes in membrane potential of the postsynaptic neuron by integrating electrophysiology with molecular biology/pharmacology that can “explain” and justify robust formal theories of macro-physiological processes of the brain such as epileptic seizures[43-45]; (2) Interdisciplinary integration between biology and “psychological sciences” (psychology, psychopathology, psychotherapy, clinical psychiatry, *etc.*): In addition to the gaps in intradisciplinary integration, no “theory” (as described at the beginning) but only mechanistic neurobiological models are developed to explain mental phenomena and their disorders. A simple reduction of the mind to the brain has not yet been realized and is perhaps impossible in principle[46]. As noted neuropsychiatrist Nancy Andreasen has also pointed out[47], “The application of technology without the guidance of astute clinicians with specific expertise in psychopathology will be a lonely, sterile and perhaps fruitless endeavor.” Consistent with this insight, the foundation of clinical psychiatry remains descriptive psychopathology as the “interdisciplinary, theoretical and an empirical study of subjectivity”[48]. The use of technology in clinical psychiatry has been a major challenge. Accordingly, it is obvious that not only biological research is fruitful, but also a structural-functionalistic psychology without explicit reference to neurobiology can produce new insights: A “network psychopathology” that emphasizes the interactions between symptoms, as realized by Denny Borsboom’s group at the University of Amsterdam using graph theoretical tools, offers new possibilities to reconstruct psychopathology without

neurobiology[49]. The results of this approach can be aligned with neurobiology, but there is no must[50]. This view fits well with our systems model of mind proposed later; (3) Interdisciplinary integration between psychiatry and social sciences (*e.g.*, integration of mental/behavioral disorders and sociocultural issues). In other words: How does the sociocultural environment enter the mind/brain? Basically, it must be conceded with Popper[51] that there is an ontological uniqueness of the sociocultural world (“World 3”[51]). His analysis also justifies a more or less substrate-free social and cultural research in psychiatry, which cannot be replaced by the very limited “social neuroscience”. The latter seems to be limited to the micro-level of interpersonal interaction. Moreover, the social world is only one dimension of the real environment, because there are natural objects, technical objects, social objects, cultural objects *etc.*, as will be explained in the third section of this paper. In particular, the closures due to coronavirus disease 2019, by deprivation show the influence of the whole environment on mental health. For this reason, we focus on the last point, namely the notion of environment.

To conclude this first chapter, our next step is to highlight some of these theoretical and metatheoretical issues, namely the difference between external and internal conditions of mental health-through challenges to a theory of addiction. We focus on the clinical limitations of the stimulus response model and the need for subjectivity and a differentiated model of the mind that also includes essential elements of the diversity of the factor “environment” in an ecological perspective. One goal is to find a productive theoretical bridge between behavior therapy and psychoanalysis, with an emphasis on the latter, even while being aware of basic criticisms from philosophy of science[52,53].

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## THEORIES OF ADDICTION – FROM PSYCHOANALYSIS TO THE STIMULUS-RESPONSE MODEL TO PSYCHOANALYSIS AND THE ECOLOGICAL PERSPECTIVE

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As mentioned earlier in reference to RDoC, addiction is currently discussed primarily from the perspective of neurobiology. Addiction psychiatry is now a laboratory- and animal-centered perspective and has fewer and fewer connections to the clinical perspective. Addiction research is even conceptually reshaping clinical thinking. Therefore, the question now arises as to how the critical arguments made earlier fit with a “practical theory” of addiction: Are clinical observations more “real” than laboratory data? Since addiction is primarily a psychological problem, it should be kept in mind that the history of concepts in psychology (and psychiatry) shows that the subjective perspective has been increasingly avoided, and “objectification” has become the guiding feature of scientific psychology/psychiatry. Although psychoanalytic explanations of alcohol addiction were among the first theories of addiction, due to various shortcomings in empirical research, concepts, methodology, theory, and the practicality of treating mental disorders through psychoanalysis, the behaviorist perspective prevailed among professionals. However, since addiction is a chronic disease, in rehabilitation and long-term treatment some of the aspects proposed by psychoanalysis, especially in relation to the holistic domain (the person in the world), still seem relevant. If the concept of environment is constructed in a differentiated but integrated way, encompassing both significant people and drugs as components of the person’s environment, a human ecological perspective might also be conceptually connectable to psychoanalysis. This will be discussed in the final section. In this section, we will focus on the components of theoretical compatibility of psychoanalysis and cognitive behavioral therapy theory as conceptual building blocks for an integrative model of the mental.

### ***The early psychoanalytic view of addiction – the topic and the structural model***

Briefly characterizing some of the roots of psychoanalysis, it is a complex theory of human behavior and a treatment method that emphasizes unconscious repressed affective-motivational drives of behavior. It focuses on the hypothetical functional structure and dynamics of the mind and assumes a powerful unconscious layer of the mind. These are the key points that Sigmund Freud elaborated with the first topic model (conscious/preconscious/unconscious) and the second topic model, the structural model (id, ego, superego). In relation to addiction, Freud[54] around 1898 interpreted addiction as a kind of masturbation as a substitute behavior for (sexual) dissatisfaction[54,55]; it is a purely self-centered behavior necessary to experience

pleasure. Later, in the 1930s, Fenichel[56] interpreted excessive drinking as a merging of the id with the ego, in order to fight together against a rigid but mainly implicit superego, which can additionally cause guilt and shame, even in a circular causal process[56]. With regard to systems theory, this model identifies the central driving force of addiction as an intrapsychic difference between a set of desired values and real values that cannot be changed by the person, which is why he or she experiences a tension that can be subjectively reduced only by consuming psychoactive substances.

Remarkably, the therapeutic effectiveness of psychoanalytic treatment of addicts did not reach widespread use, and soon the behavioral approach in psychotherapy began its triumph. The problem of addicted clients at first contact – even after detoxification – did not show stable sobriety for analytic treatment, the lack of experimental and quantitative empirical evidence, and also the apparent arbitrariness of theoretical concepts devalued psychoanalysis of addiction and hindered the development of psychoanalysis in this clinical field. As a basic result, a fundamental reorientation toward learning theory occurred in clinical psychology. In the following, some of its basic theoretical features are briefly described and compared with psychoanalytic concepts.

### ***Behaviorist view of addiction – the stimulus-organism-response model***

Since the beginning of the 20<sup>th</sup> century, the behaviorist conceptualization of mental states and processes has been increasingly favored in psychiatry and also in addictive disorders with reference to the stimulus-response (SR) model, with the organism as a black box (or grey) box [stimulus-organism-response (SOR) model] without presupposing mental states and processes. For this basic epistemological position of analytic behaviorism/positivism[57], animal experiments in particular have provided the empirical basis for theoretical considerations. Here, we also start from this clear but superficial perspective; however, we will also criticize it in order to outline finally an ecological perspective through an onion skin-like systemic multilevel model of the situated person that takes into account a macro/micro-layering of environment and person.

Fundamentally, addiction can be characterized within a SR model as a learned extensive affinity for an object, which usually is a drug as a chemical stimulus[58]. A more theoretical definition characterizes addiction as “a syndrome at the center of impaired control over a reward seeking behavior”[59]. This implicitly assumes antagonistic forces (drivers and brakes) that determine overt behavior.

As an extension of the SOR model, the SORKC model has been successfully proposed, emphasizing the power of sustained contingencies (K) of consequences (C) [60]. In addition, classical conditioning considering contextual stimuli that become conditional stimuli and social learning through a behavioral model has been shown to be useful in understanding specifics of addiction development[61]. In treatment, all these perspectives are used as theoretical reference points for the development of therapeutic strategies. Recently, even the simple SR concept of habitual addictive behavior was successfully applied to a computer-based training to avoid alcoholic beverages presented as an image on the screen that had to be pushed away with a joystick. This training with virtual reality tools helps to balance addictive sensorimotor routines[62]. Here, we go into some conceptual details of the behaviorist approach.

### ***Reinforcement as reward – does it correspond to pleasure?***

Within the SORKC model, the occurrence of addiction is conceptually explained by reinforcement mechanisms, which represent the animal model of operant conditioning. These mechanisms are often referred to as reward mechanisms, especially in the context of neurobiology. For clinical tasks, a subject-oriented view is helpful: The (increasing) affinity to a drug can be experienced by the addicted person himself, after drinking alcohol most people experience an improvement of mood, as already impressively described by the alcohol dependent writer London[63] in 1913. In other words, the reinforcer (or reward) is experienced, in anthropomorphic terms, as a pleasant state and/or a reduction of an unpleasant emotional state. This improvement in emotional state acts as a positive feedback loop on the behavior, increasing the likelihood of its occurrence and thus “reinforcing” it[64]. Some pleasurable experiences are associated with the reduction of tension or stress. Consistent with this view, the early Freud’s version of the pleasure principle[65] appears within new guise [65].

However, another question arises: Why do some drug-exposed individuals develop addiction and others do not? Is there an intrinsic risk for addiction? This question can be explained by looking more closely at the external conditions but much more so at internal conditions. For example, psychiatric comorbidity (anxiety, depression,

borderline personality disorder, *etc.*) may “drive” alcohol use, although some of these psychopathological conditions may also be “caused” by alcohol[66]. This organism-based explanation is theoretically consistent with the concept of affect regulation or stress management through drug use, and in the context of psychoanalysis of addiction, it is consistent with the complex self-medication hypothesis[67].

### ***The cognitive turn – modeling thought cascades without a self-model?***

In the experimental context, the classical SOR model was soon improved by admitting that “internal” cognitive processes and representations matter for understanding behavior, a view effectively proposed by Tolman[68] and Neisser[69]. The cognitive approach also implies that the organism must have an internal model of the external world and also of the organism itself, which will be discussed later.

In the clinical context, Beck *et al*[25] introduced the cognitive turn for almost all mental disorders, focusing on the mood-organizing power of cognitive processes[25, 70]. The cognitive model of addiction is based primarily on conscious self-descriptions: Situational perceptions, expectations (*e.g.*, of drug effects), thought processes, decision making, explicit memory, behavior planning, and other states and processing have been considered relevant to addiction. For example, in a stressful social situation, an addicted user thinks that he or she is disliked by others, with these thoughts reinforced by underlying dysfunctional cognitive schemata (“I am a loser”). These cognitive schemas and cascades of dysfunctional thinking are the targets of therapeutic intervention in CBT for mental disorders: Change in addictive behavior is targeted through changes in situational processing, cognitive coping with stress, consideration of positive and negative consequences of drinking and abstinence, *etc.*

Although a foundation of CBT is cognitive schemas, which are also associated with a concept of a self-model of the person through the notion of “dysfunctional assumptions”, an explicit definition of the self/self-model is not usually used, as it is conceptualized only as a recursive (rigid) self-description of the person (“I am a loser”). In terms of cognitive schemata as a theoretical building block in CBT, there is a conceptual correspondence to the psychoanalytic concept of (dysfunctional) self-representation. In relation to this theoretical concept of self-representation, Kohut[71, 72], a pioneer in analytic self-psychology, has influentially explained drug use as a pathological narcissistic act[71,72]: The developmental non-existence of the emotional other, caused, for example, by distant parents, induces a deficient self-representation (and object representation), with the drug literally filling up these empty spaces of images (defect of the self). The drug functions as a “self-object” and contributes to psychic homeostasis. This theoretical position also makes it possible to understand the difficult therapeutic relationship in which the addicted client uses the therapist in a narcissistic mode, especially when the client is abstinent, he uses the therapist in the transference situation in a parallel mode to the drug.

### ***Behaviorist models of self-regulation – who is the regulator?***

The old notion that the drug initially serves as a regulator of the addict’s affective state has also been successfully developed within the framework of learning theory and cognitive theory and can be subsumed under “self-regulation” models. As early as 1970s, some researchers such as Kanfer and Goldstein[73] and Kanfer[74] in the context of learning theory criticized the concept of stimulus determination of behavior and passivity of the person as seen in the framework of SOR model[73,74]. He emphasized the possibility of “self-management” for patients (*e.g.*, in tobacco addiction). Self-observation, self-evaluation, and self-appraisal are circularly linked process components of smoking behavior control that can be influenced by behavior therapy. This influential model corresponds conceptually with models that focus on “self-control” and “self-regulation”[75,76]. Interestingly, why and how regulation is regulated is often not clarified. From a metatheoretical perspective, these models are process-oriented and neglect to model structures of the mind. In other words, these models do not explicitly refer to the concept of a “self” or “self-model” or an “ego” operating in the loop. In contrast, within the psychoanalytic structural model, the ego is the regulator that can use drugs to relieve tensions between external reality, the id, and the superego. Moreover, in relation to the topic model, drug use can be understood as a defensive strategy of the ego to suppress or overcome implicit emotions such as anxiety, anger, and depression that occupy and deform explicit consciousness (*i.e.* “self-medication hypothesis”).

### ***The integrative power of the psychoanalytic model – translation of concepts***

So far, it has been shown that some phenomena of addiction are well covered by data

and models of academic psychology, and others can be explained by psychoanalysis. Theoretical overlaps between these two approaches - for example regarding the function of the "self" - differ in the definitions and theoretical elaboration of the respective models. To achieve better integration, a combination of behaviorist and psychoanalytic perspectives might be useful, especially with regard to the heuristic significance of the assumption of drug-induced mental homeostasis based on an unbalanced mental system. An interesting special theoretical aspect of psychoanalytic models is that they are implicitly "ecosystemic" models of the mind, in that they account for multiple internal interactions of environmental feedback loops. They also appear as a kind of "ecological" model, since it is assumed that the concrete social environment of the person, namely the family into which that person was born, represents a set of factors that determine the mind. However, this (implicit) ecosystemic view also makes it difficult to identify, for example, a "causal locus of control". Is the ego too weak, is the superego or id too strong, is the self model or object model too deficient, or are the resulting conflicts too strong? Here we can only refer to some theoretical questions. (1) Regarding the conceptual connection between the reward and pleasure principle, *i.e.* mood elevation through drug use, the question arises: What are the conditions for unpleasure and/or pleasure? Pleasure is difficult to define because of the qualia problem (see first paragraph), but it can be experienced in the release of tension. Tension can be explained in systems analytical terms as the result of the clash of opposing forces such as urgent drives and behavioral inhibitions (go/no-go condition). In the context of the structural model of theoretical psychoanalysis, this description reflects the contradictory relations within and between the affective-motivational id and the repressive superego experienced by the ego. But drug exposure raises the question: Who is stronger, the driving id or the suppressing superego? From the psychodynamic perspective, drug use can also be interpreted as an additional defense strategy of and for the ego, aimed at reducing negative emotions and the experience of helplessness or powerlessness[77]; (2) A pathogenetic predisposition to addiction through the dominance of the superego was favored by Wurmser [78]. Wurmser[78] emphasized, in agreement with Fenichel, that drug-induced gratification of the infantile narcissism by removing the control of the superego is a major cause of persistent drug use. However, this model needs to be diversified in terms of the architecture of the conflicting forces: For example, the urge to work until a task is completed is usually implemented and enforced by the parents, in most cases the father. Failure to achieve these goals leads to bad feelings. Functionally, the more or less implicit idea or representation of the challenging father is a component of the superego. In addition, one might assume that the internalized image of the supportive mother allows for relaxation. However, it is important to keep in mind that the internal images of parents include more than their normative and supportive components; and (3) there is the question of where and how parents (and/or significant others) are conceptualized in SOR or cognitive models. For example, the dysfunctional assumptions ("I am a loser") are valid theoretical constructs in CBT, but the question arises as to their origin. To answer this question, it can be hypothesized that the parents' recurrent comments about the person's behavior are stored as basic reference values and as the core structure of the person's idealized self-image. This explanation of the emergence of "dysfunctional assumptions" in the context of CBT is consistent with the psychoanalytic model regarding the functional role of the superego and the self-image, which must be viewed in relation to the image of significant persons in the environment. This is elegantly captured by object relations theory and the concept of 'internal working models'[79,80]. This is currently being discussed in the context of the new theories of psychoanalysis.

### ***Toward an integrative theoretical model of the mind***

Consistent with the arguments presented earlier, we propose to design a psychological theory for psychiatry using conceptual building blocks from psychoanalysis.

In his search for the origins of human knowledge and the role of memory in our ability to experience, Freud concluded that many of human mental processes although unconscious, influence our overt behavior. In his analysis of symptoms, he postulated that each of them makes sense when one considers that important processes of the mind operate below the level of conscious awareness. Drives associated with basic needs (*i.e.* basic biological instincts) and social demands directed to the individual by the environment and context shape the person's personality, intrapsychic structures (ego, id, and superego), and mental capacities. Repeated interactions with the caregiver and other relevant persons in early childhood shape the way reality is experienced and perceived, leading to implicit knowledge and behavior patterns[81-84]. Emotional reactions that occur during interaction with others and the environment

are perceived and are more or less regulated from moment to moment. Thus, they can be transformed into signals that act as meaning markers and influence memory encoding and cognitive processing. The early social environment, such as relationships and interaction patterns with primary caregivers, influences behavior (*e.g.*, exploratory urges, attachment patterns, expression of mental and affective states). Norms and values have to be integrated; commandments and prohibitions of the culture first are mediated by the respective others; submission to them is often ambiguous and has to be worked out first in order to be tolerated without doubt[82].

Within these reciprocal experiences with the reference person and the basic environment, adaptation to reality is one of the main goals of psychoanalysis, reality being the starting point of unconscious fantasies, indicating the distinction between reality and fantasies is important for mental health and illness[85]. Psychodynamic considerations take into account subliminal signals (*e.g.*, through language, gestures, facial expressions) and latent perceptions of stimuli as well as unconscious and embodied knowledge; they aim at reshaping cognitive processing (*e.g.*, perception, attention, memory) by creating new ways of seeing and experiencing in the analytic relationship.

### ***A framework for the processing subsystem***

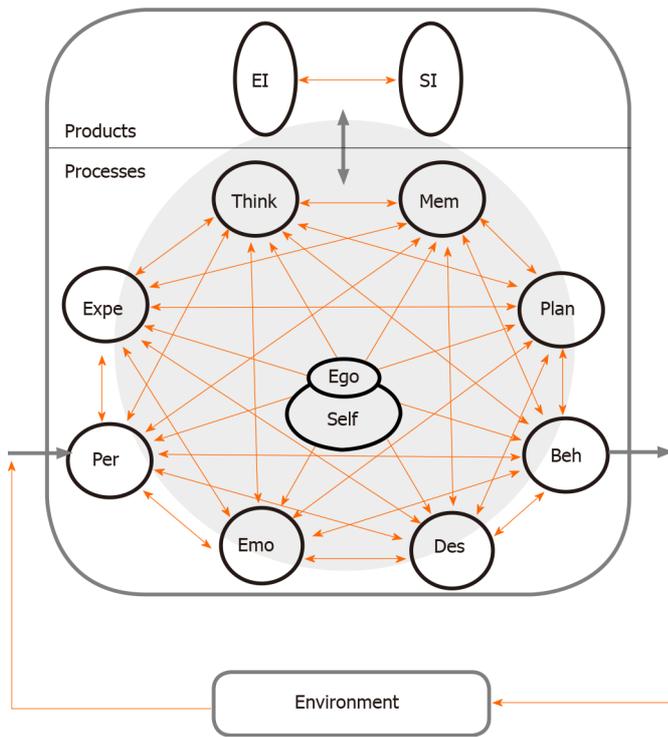
Taking together, these psychoanalytic issues and various cognitivist concepts used to describe the addict's internal processes, such as expectation, cognition, memory, decision, *etc.*, and also considering the importance of affective internal representations, an integrative view of addiction-related human information processing yields a systems model of the mind. This systemic model must first correspond with the symptom checklists of clinical psychiatry, which explore perception, thinking, memory, emotions, drives, *etc.* as functional elements of the mind, here linked in a basic conceptual network of the mind. Also, the concept of a self with an operational part of the ego is heuristically useful for understanding self-regulation. The important point of this model is the possibility to explain the functional relationships between these components (Figure 1)[86,87]. Since the first of these modeling attempts, several similar but partial models have been proposed in addiction theory[88,89].

### ***The structure of representations as a reference system***

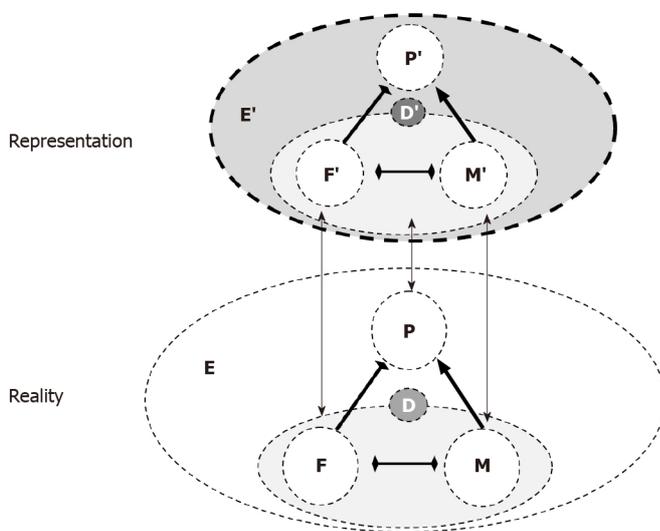
In the proposed systemic model of the mind, the level of representations (or images or affective-cognitive schemas) serves as an internal reference system for further information processing, and it is also modified by this processing (EI and SI in Figure 1). It consists of three subsystems: Representations of the self, of the environment ("objects"), and of the interrelations. These representations are processed through thinking and emotional appraisal and stored in different layers of memory, so that they can function as a reference system. They are products and contents of mental processing.

In this context, it is important to emphasize that in the behaviorist view, the environment is generally conceived as the world of "stimuli": Looking more closely at the world of "stimuli", drugs (such as a bottle of beer), for example, are "salient" stimuli in the addicted person's environment, and they have an "incentive" quality for consumption. From a psycho-ecological perspective, they have a positive valence. However, the many efforts to interpret the concept of "stimulus" in the concrete "environment" of the addicted person are not fundamentally related to the trivial fact that the family (and its drug use) is the first type of social environment. The family as a system with its various elements such as mother and father and their relations (harmony, broken domestic situation *etc.*) and their relations with drugs is the framework for the child's drug use. The family exists both as an external reality and as an image in the mind, and it influences the client's experience even when parents are already dead. This issue of the contextual conditions of mental disorders was a foundation of psychoanalysis when Sigmund Freud developed his influential conceptual framework of the Oedipus conflict that, today of course, requires more subtle interpretations and clarifications. In psychoanalysis, the patient's relationships with parents are a central theme of therapeutic reflection and intervention[90].

This leads us to the heuristic value of a wider concept of "environment" that describes the surrounding world of the individual as it acts as an initial frame for behavior, for example, the family of an adolescent drug user (*e.g.*, the son): The tension caused by the incompatible relationship with the overdemanding father and the overprotective mother can lead to a chronic conflict. This conflict has two epistemic sides: It plays out not only in the psyche of the adolescent with the dysfunctional (more or less explicit) image of his parents but also in the reality as seen by the therapist (Figure 2). The experienced incoherent action structure of the parental dyad



**Figure 1 Visualized systems model of the mind.** The list of subsystems being checked in psychiatric examination are represented here as interconnected mental operators (subsystems) within an operationally closed network. Consciousness is represented here as a shaded circle, regarding the metaphor of light and dark. Not all relations, especially of the ego/self, are depicted here in detail[88]. Perc: Perception; Expe: Expectation; Thin: Thinking; Mem: Memory; Plan: Plans of behavior; Beh: Behavior; Des: Desires; Emo: Emotions; EI: Environmental image; SI: Self-image as affective-cognitive schemas.



**Figure 2 Model of reality and affective-cognitive representation of the adolescent drug using person (P; D, drug) and his or her family as the environment (E): The demanding father (F, with line with transom) and the supporting mother (M, with arrow) induce tension for the child that results in drug consumption for sedation and/or escape.** In addition, the parents oppose each other (line with two transoms). The model depicts the reality (E, P, F, M, D) and the mental representation by the patient (E', P', F', M', D').

may be an important trigger for drug use. Consequently, the family structure of the young drug user is one a very important topic for therapeutic exploration.

However, in line with this theoretical and practical insight, the term “environment” needs to be more differentiated, as the adolescent drug user is involved in other environmental subsystems: His peer system, the world of school, the leisure space, the community, the internet, *etc.* In other words, not only the family but the whole “ecology of the drug user” has to be explored by the therapist[91]. This complex relevance of the term “environment” (and relations) demands some deeper meta-

theoretical consideration.

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## “ENVIRONMENT” – ORDINARY LINGUISTIC TERM OR PHILOSOPHICAL CONSTRUCT?

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The theoretical importance of a solid conception of “environment” is not sufficiently considered in psychiatry. As for biological reductionism in psychiatry, the goals of environment-related research also exhibit some conceptual and epistemological simplifications that are misleading. Surprisingly for biologists, the use of the term “environment” in biological psychiatry usually is mostly based on a very vague meaning of everyday language: For example, in the extremely important gene-environment interaction studies 20 years ago by Caspi *et al*[92], “environment” is operationalized only by stressful situations, such as childhood maltreatment, mainly by the family[92]. These conceptual shortcomings can also be observed in RDoC as will be explained later. Interestingly, it neglects a very important epistemological distinction that emerged more than 100 years ago in the context of the history of biology (and ecology/environmental science): (1) The objective environment as seen by the remote researcher; and (2) The subjective environment as experienced by the immediate living being.

If we briefly concede at this point that “objective” is shorthand for the sophisticated scientific observation reported through data and “subjective” is the phenomenal appearance reported verbally, we think that this categorical dichotomy is at least workable in practical psychiatry, although “objective” is not an epistemologically grounded category from a constructivist point of view, since scientists are also subjects and can only represent a methodologically grounded “intersubjectivity”. From a pragmatic point of view and for a clinical psychiatrist, a very important challenge in the diagnostic phase is to compare intersubjectively, together with the patient, the objectively observable (and possibly data-based) situation with the subjectively experienced situation, in order to identify a paranoid processing of the surrounding world.

Interestingly, a pragmatic dichotomy of objective/subjective is also important in human biology as it partly reflects a difference between natural science (molecular biology) and sciences of the mind or phenomenal self-awareness (phenomenology). This problem of a double methodology corresponds to the philosophical qualia problem beautifully formulated by Thomas Nagel: “What is it like to be a bat?”[93]. This question deserves closer consideration here.

### ***Biology and ecology – the physical environment and the sensorimotor loop***

In ecology as the science of the relationships between environment and organism, environment is a crucial concept. Consequently, it must to be emphasized that Ernst Haeckel, the founder of academic ecology, defined environment as the “surrounding external world” (or “the surrounding external space”) of an organism, referring mainly to the physical-chemical environment[94]. From a philosophical point of view, this position is associated with a positivist, empiricist, objectivistic, reality-based view. In contrast, but independently, Jakob von Uexküll’s environmental theory (“Umweltlehre”) focused on the informational realm, namely the perceptual and effectual world surrounding an animal, and emphasized that organisms only selectively receive environmental stimuli, a subset which he called the “Merkwelt”, and that organisms can also only selectively act on the environment, a subset which he called the “Wirkwelt”[95]. With his analysis, Uexküll elaborated the importance of subject-centered attribution of meaning to the external world and so is thus considered the founder of biosemiotics. In this respect, this view was also called “phenomenological biology” or “subjective biology”, which means that the term environment only makes a functional analytical sense, when it is related to information processing properties of the respective living being. In line with this view, Uexküll completed the picture by connecting “Merkwelt” and “Wirkwelt” through the model of a “functional circle” constituting organism-environment interactions. This kind of concept emerges in phenomenology and ecological psychology reducing the gap between the “outside” and the “inside”, leading to a kind of circular psychology by emphasizing the operational closedness of information processing and generation.

### ***Psychology – the informational environment/world***

The aforementioned dichotomies of “internal” and the “external” or “subjective” and

the “objective” in early ecological psychology (or psychological ecology) were essentially reflected in critical controversies between Kurt Lewin[96] and Egon Brunswik[96,97]. Brunswik[97] emphasized the external world as it is perceptually screened by ecological sampling, while Lewin[96] focused on the topological structure of internal representations of the world that he called “habitat”. Certain subsets of the habitat exert a field-like “valence” on the person, but barriers may oppose this appetitive disposition and behavior. Later, James Gibson[98,99] proposed a hybrid conception that assumes that perception of the world depends on action, and action depends on perception of the world, a circular model similar to Uexküll’s functional cycle[98-100]. In his dynamic view, the perceived image of an object is the still frame of a movie created by movements (*e.g.*, of the eyes and/or the person). The cues of the physical world as its significant stimuli during movement are vectors that are processed by the sensory system, looking for invariants in the flow of stimuli, resulting in images such as “gestalts” as discussed by Gestalt psychologists. Gibson[98,99] also understood the external visual world as a “stimulus array” that acts on the human subject as “affordances” by and for intentional actions of the person: The structure of a chair becomes visible through the by exploration of this object and then it “offers” the possibility to sit down.

Gibson’s work can serve as a reference for new phenomenology that emphasizes the intertwining of the individual with the world as proposed in the anthropological concept of the person as an embodied, embedded, extended, and lived mindful being [101,102]. Interestingly, the conceptual bridge from the physiological sensorimotor level to social psychology has a long tradition of discussion in the context of ecological psychology[103].

### **Sociology – the textual and communicative world as the social environment of actors?**

The “social environment” is only implicitly touched in RDoC through the category of “social function”, a domain exemplified by social dominance, affiliation/separation, identification of facial expressions, self, *etc.* It should be measured by self-disclosure and behavioral analysis but also at the genetic, molecular, cellular, circuit, and physiological levels. The social conditions of mental states and mental processing-family integration, socioeconomic class, educational level, social support, *etc.* are important, however, because social functioning requires a certain level of social integration and vice versa[104]. In addition, urbanization, migration, neighborhoods, unemployment, group membership, ethnic diversification, gender issues, *etc.* are also issues that are rarely explicitly considered by the biological perspective of RDoC.

Obviously, these categories are not essential in RDoC, and it seems that social theories are not covered by RDoC. For example, social anomie, lack of social resonance, and similar aspects of social order and social relations are not explicitly included for study. By construction, RDoC seems to underestimate the top-down causality (and reciprocal bottom-up causality) of individual behavior through social rules[105], the influence of social structure on action[106,107], *etc.*, which are at least mediator or even moderator variables of mental health.

But what does “social” mean? It is important to note that in modern sociological theory, the social as an epistemic object is more than the population; it is a set of operations (actions) and rules that relate to interpersonal and interinstitutional domains[107]. “Social” also means a culturally specific definition of norms, values, beliefs, *etc.* by which someone functions. In turn “functioning” means performing a social role, especially in the context of organizing a social system, institution, social space, or behavioral setting (see below). In the context of psychiatry, the term “social” in most cases refers to the micro-level of interpersonal interaction and communication as the object of knowledge, while on a mesosocial level, groups and organizations are the object of social scientific investigation that finally, on a macro-level, also analyzes society and its social subsystems such as science, law, religion, economy, state, politics, *etc.* In other words, one must admit that individuals exist in the context of multiple social systems (*e.g.*, economics, law, science) and are confronted with institutions through rules of action: To pay or not to pay, to be right or wrong, to be true or false in relation to socially defined “reality”, *etc.* The consecutive relations between the individual and the social environment mean integration or exclusion: If I cannot pay I cannot participate, if I am wrong I must accept punishment otherwise I will be excluded by imprisonment, *etc.* A society based on the rule that everyone is responsible for his own destiny would not organize public support systems for marginalized people (*e.g.*, the chronically mentally ill), who more and more exhibit a multiple downward spiral to homelessness. In general, the top-down modulation of

individual behavior by macrosocial concerns is seen as a systemic colonization of the individual lifeworld[108].

As a methodological consequence, the social domain can be explored analytically but only on a multivariate correlational basis and not seriously on a causal level. In accordance with this methodological limitation, social neuroscience should compare electroencephalograms and other biomarkers of subjects belonging to society with a strongly state-controlled economic order with the question: Is there a correlated difference (covariance/variance analysis)? And if so, can it be ruled out that there are other factors such as biological or psychological (and micro-social) variables that cause this difference?

There is another more profound methodological problem in social science that has already been addressed: Categories of the social can be measured objectively to some extent, as empirical social science does, but for behavior the subjective side is more important: How do I experience the world? This subject-centered view was already fundamentally emphasized by the philosopher Husserl[109] who constructed the subject-centered concept of a world view he called “lifeworld”[109], which was further developed especially by the Austrian sociologists Schütz and Luckmann[110,111], Berger and Luckmann[112], and also Habermas[113]. Another influential approach in sociology, namely the work of Bourdieu[114-116], must be considered. Bourdieu[114-116] conducted empirical studies in Algeria and developed new theoretical categories to describe the context of social behavior (*e.g.*, concepts such as “social space” or “social fields”). Interestingly, Bourdieu[114-116] acknowledges an objective social reality and not only its constructedness by the subject and society, as constructivists often see it. In relation to psychiatry, cultural psychiatrists also noted, that “culture is in the head/brain/mind and in the environment”[117]. The “social” in psychiatry is a social reality.

However, there is another side to the “social” in psychiatry; practical clinical work requires close collaboration with social workers to optimize service to patients. Consequently, knowing how social workers think, *i.e.* the theoretical background of social work, is useful. Social work theory is mainly based on aforementioned concept of the “lifeworld” model derived by Husserl[109,118,119] and is often associated with Bronfenbrenner’s[120] approach to psychology[120]. This is another good reason to differentiate the concept of “environment” in the context of psychiatry.

### ***Towards an integrative taxonomy of the term “environment”***

Looking back at this section on the different aspects of the concept of social environment and in terms of its essential importance for mental health, the distinction between the physical environment facing climate change and the digital environment with its virtuality and the machine-based technical environment (*e.g.*, robots) should also be made clear. Moreover, the “natural” environment (and its hazards) may be an interesting field for psychiatric research. In other words, an explicit taxonomy of the term “environment” is useful, similar to that used in ecological (and environmental) psychology. These semantic distinctions imply a holistic concept of environment that also covers the heterogeneity of topics mentioned earlier. Interestingly, almost no biological psychiatrist refers to ecology, which is a biological field of research and had a strong influence on sociology and (psychiatric) epidemiology in the first half of the 20<sup>th</sup> century. Perhaps in the context of studies of “urbanity” and mental health, there is a revival of the ecological view[121]. With the aim integrating these different meanings of the term environment, we present an outline of a comprehensive conceptual framework for a more precise use of this term, which is already useful in the context of ecology and sustainability science.

First, it is important to recognize that the general term environment also includes semantically similar terms in the scientific context, such as environment, “context”, “setting”, “behavioral setting”, “social space”, *etc.* These terms have specific meanings, but they share a common semantic stem, namely the “external” (or “surrounding”) world. From a systemic perspective, the external world is a system of elements that are related to each other and to the living being as observer and actor. These elements are often referred to as “factors”, “dimensions”, “areas”, “levels”, *etc.* However, there is no universally accepted convention on the taxonomy of these concepts. Moreover, there are no interdisciplinary accepted definitions and/or conceptual explanations of these terms. Here are some semantic diversifications that can help clarify meaning when “environment” is used in interdisciplinary communication[122].

Basically, it has to be taken into account that the distinction between system and its environment is a (physical) distinction with a more or less concrete boundary structure (skin, membrane, entry rules of a social system) that constitutes the system. At the very least, the observer of the system must construct a conceptual distinction. This

issue has been widely discussed in systemic family therapy[123] and sociology[124]: A system constitutes itself by constituting and/or enforcing or extending its boundary structures.

Consequently, the categorical and real distinction between system and environment implies the notion of a "relation" (*e.g.*, a boundary relation such as inclusion or exclusion mechanisms or rules) between a social system and its environment. From a cell biological point of view, this difference is established up by the *membrane* with its ion channels and its gating and ion pumps that "establish" the difference between the external and internal environments. Psychologically, objects of the environment have an attraction, a valence, or an affordance (or a repulsion) for the person. This disposition is often meant when one uses the very general term "relation". However, this term deserves further analytical consideration, which can only be touched upon in the final section of this paper.

If we summarize these semantic aspects of the term "environment" in a preliminary taxonomy, we can highlight some points (Figure 3): (1) The distinction between "objective environment" and "subjective environment" is necessary because it has already been figured out (*e.g.*, measured and/or experienced air temperature). It is an everyday experience of any self-critical person acting in a social context. The history of scientific discussion in psychology and sociology also shows that this distinction is irresolvable. Philosophers distinguish the objective "third person perspective" and the subjective "first person perspective" and emphasize that the subjective experience precedes the scientific view of the external world; (2) The temporal dimension is evident in the heuristic usability of the concept of "past", "present", or "future" environment. The developmental ecological psychologist Bronfenbrenner[120] proposed the concept of a chronosystem representing the significant ecological transitions when a child becomes an adolescent, an adolescent becomes an adult, a student becomes a researcher, *etc.*; (3) As for the objective side, the external environment is primarily a spatio-temporal world, that can be described in terms of physics and other natural sciences, but perceptual Gestalt psychology has shown for decades that the experienced world is also the result of constructive processes of the subject and the society. Construction is not possible without elements, so for the construction of an image (Gestalt) of an object of the world, the constitution of relations of its elements is essential. In line with this spatial dimension and in a systemic view, the distinction between a micro-level (family, work, and school), a meso-level (community), and a macro-level (society) has been influentially emphasized by Bronfenbrenner[121]. The microsystem is primarily understood to be the family, but the school or workplace, the recreational sphere, and other sub-areas of individual's living space are also addressed by this level. The meso-environment (or meso-system) is the summary of these micro-environments. The meso-level is embedded in the macro-environment of the society, which is referred to as the macro-system. Bronfenbrenner also introduced the notion of the exo-system, which influences the person but that in turn cannot be influenced by the individual; (4) Entities: With this term we propose to distinguish between material-energetic or physical *vs* immaterial (informational) environment. In addition, scientific ecology distinguishes other sub-entities, such as inanimate natural (abiotic; soil, water, air), animate natural (biotic; microbes, plants, animals), technical, personal, social, cultural, *etc.*, environment. The everyday understanding of these terms is sufficient here, but a precise definition remains difficult, especially since there is currently no philosophical ontology (see above); (5) Spheres of life: Lifeworld, work world, *etc.*, are environmental domains that are distinguished according to their functional importance for people. They are separate but partially overlapping spheres of life that are concerned with these issues (home office); (6) Qualities: Environmental characteristics can be classified as "good" or "bad" in relation to the environmental effects experienced by the person (attraction, repulsion); (7) Quantities: These environmental properties can be represented, for example, as the density of the respective environmental elements occurring in the space-time framework. A stimulus-rich world may trigger stress in a busy person but may also be perceived as pleasure by a bored individual; and (8) Effects and their directionality: Impacts, effects, and interactions are corresponding categories.

This taxonomy should not be understood as a rigid framework but as a reference for important specifications and distinctions in interdisciplinary communication; the communicator should define what he or she understands by the chosen term.

This taxonomy can also serve as a guide for the term relation. Although in the context of psychiatry one usually means "social relationships" by this term, relationships can be observed objectively/subjectively at certain times, at different levels (micro/macro), in terms of physical or interpersonal dimensions or domains, in

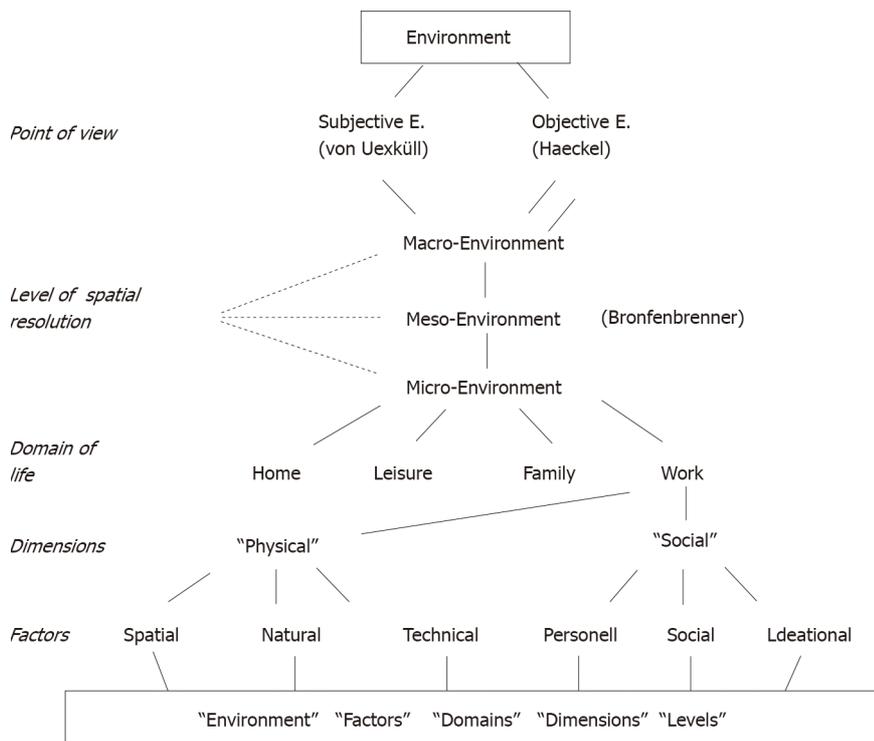


Figure 3 Conceptual taxonomy of environment-related and partially interchangeable terms (details see text).

terms of lifeworlds (work *vs* leisure domain) and the experienced quality and quantity *etc.* This will be revisited in the next section, where we outline the ecological perspective in more detail.

## CONTOURS OF A NEW THEORETICAL FRAMEWORK – “ECOLOGICAL PSYCHIATRY”

We now we try to put together the things that have been distinguished before and propose a sketch of an integrative conceptual framework of a human ecological perspective, which has some cross-disciplinary traditional roots but is not yet really established in psychiatry and is also only rudimentary in medicine: (1) The first section has shown that psychiatry lacks an area that can be called a “theoretical psychiatry” and that the methodological plurality needs knowledge integration as it was proposed by the bio-psycho-social model. It is believed that the best basis for a general theory of psychiatry could be the modern psychoanalytic theory, especially since it is currently elaborating its roots in neuroscience [125-127]. Moreover, the last fundamental theoretical developments in psychoanalysis that led to in modern object relations theory could be a fruitful basis, also for an ecological perspective; (2) The second chapter on addictions showed the usefulness of the behaviorist approach but also highlighted the heuristic relevance of psychoanalytic thinking and modeling, where “relationships” are the key issues, even if its therapeutic relevance sometimes only comes into play at a later stage of treatment. Using the clinical example of adolescent drug addicts, it was emphasized that the family, as the most important social environment, has always been a constitutive theme of psychoanalysis. Thus, psychoanalysis *per se* has always been a bio-psycho-social approach; (3) In the third section, the semantic complexity of the term “environment” was pointed out. This chapter also pointed out the theoretical disparity of the “environment” when considered as a set of stimuli and/or as the family; and (4) Taken together, these issues imply a conceptual framework based on a differentiated but integrated model of human-environment relations as a system that is provided by the human ecological approach. But what exactly is “ecology”, and what are constitutive concepts?

### ***The human ecological framework in psychiatry – knowledge and theory integration***

As mentioned earlier, ecology as a biological science was founded by Haeckel [94] in

1866 and was defined as the science of the relationships between organisms and their surrounding environment[95]. For a time in the 20<sup>th</sup> century, this approach, which aims to understand human living systems, had a major influence on disciplines such as sociology, geography, psychology, epidemiology, *etc.* Several very general calls for a systemic ecological perspective have also been published in psychiatry[128-130]. In a similar vein and in relation to clinical issues of addiction, an ecosystemic multilevel perspective was proposed in the 1990s under the name “Ecology of Addiction”[92]. Following this, a generalization as “ecology of the person”[131] has been published and recently further elaborated[122]. This corresponds with the call for a “neuroecology”[132,133] or even for an “ecology of the brain”[134].

Rooted in cultural psychiatry, Kirmayer and Crafa[21] recently proposed an “ecosocial psychiatry”[21]. Emphasizing the need for a “new science of psychiatry” he argued: “A multilevel, ecosocial approach to biobehavioral systems is needed both to guide relevant neuroscience research and to ensure the inclusion of social processes that may be fundamentally contribute to psychopathology and recovery”[135]. This approach has been used as a basis for the development of a new science of psychiatry.

As a result, we propose here a person-centered and environment-centered view in psychiatry that considers the patient as a “situated subject”. We also propose a multilevel systemic view of mental disorders that focuses on the mind as an information processing subsystem. This systemic ecopsychiatric perspective appears as the logical integration of the current counterproductive divergences between research and practice.

In this sense, and in relation to addiction, a first step of theoretical integration seems to be possible by linking the psychoanalytic model not only to CBT, but also to the ecological psychology of Lewin, Barker, Gibson, and Bronfenbrenner, by linking it to the “ecology of the mind”[136] and the phenomenology of the embodied, embedded, expanded, and performed subject[137]. These efforts could lead to an “ecology of the person” that offers more coherent options for understanding disorders and planning their treatment and prevention[131].

With this in mind, we want to move toward a human ecology view of mental disorders based on the previous sections of this paper: We will propose three conceptual building blocks – the anthropological concept of the person, the ecological concept of the environment, and the analytical concept of the term “relationship”.

### **The person**

The person can be described in a multidimensional framework, for example, when it comes to the clinical context[122]. In clinical psychiatry, about eight basic dimensions are usually checked: Time (When were you born?), space (Where do you live?), physical state (Are you physically well?), mental state (How are your memory functions?), linguistic competence (How can you describe your feelings?), social domain (Do you have a relationship?), cultural aspects (Religious belief?), and economic status (Are you employed?). This information provides a treatment-relevant framework of the situated person and is not theoretically integrated.

### **The “environment”**

The complex meaning of this term has already been discussed at length. Related to basic clinical practice, as highlighted above, five of the above questions deal with the person’s environment: The temporal, the spatial, the social, the cultural, and the economic. These are some essential dimensions of the surrounding world that determine the manner and quality of the persons’ existence, with implications for health status.

### **The relations**

The categorical distinction between the person and her environment is counterbalanced by the concept of the relations: A relation is basically conceived here as a disposition between two elements that is recognized by an observer, such as a doctor in a clinic or the subject or the researcher: What are the subject’s relations with his or her parents? In this construct, too, the first essential distinction is the epistemological one, between the “objective” relationship as seen by the expert and the “subjective” relationship as seen by the patient. Although there are varying degrees of realism within the views, which may even be paranoid in nature, these dichotomous distinctions are pragmatically useful here. The relations of the internal and external psychosocial environmental relations between the person and their environment in terms of affective-motivational values must be optimized in therapy. Consequently, the occurrence of objects (persons) in the environment that are similarly structured to

the reference objects of the representation evokes old patterns of cognitive-affective processing.

Although a similarly detailed analysis of the concept of relations as shown in this paper for the concept of “environment” is necessary, the issue of relations is already addressed essentially in object relations theory[80,138,139]. It is the affective valence of relations (or the quality of affects) that causes the appearance of environmental objects. It is, of course, co-determined by the sociocultural context. The system of relations as a “structure” of the representational system of the object and the subject and their interrelations can be distinguished in a simple but more systematic way: The relations of the person to the environment can be classified as processes and thus with “fugal” and “petal” directionality: The giving and the taking. In the abstract mathematically oriented terminology, the taking is often preceded by a demanding, and if a giving is not accepted it is a refusing. The content of the relationships, the entity transferred, for example, information, matter/energy or love, support, *etc.*, is central (Table 1). These framing concepts have not yet been translated in this form into the psychoanalytic terminology. Interestingly, they have some roots in the social psychological school of exchange structuralism[140,141]. Although developed in the context of economic studies, they can also be used to describe interpersonal interaction within the family: The father demands performance from the child and thus has a demanding image for the child, the mother supports the child and has a supportive image for the child. As a result, the polarized image of the “bad father” and the “good mother” emerges and solidifies as object representations with their respective emotional charges. In other words, the content of the actions or the (verbal) signals of the relationship can be categorized as acknowledgement, care, support, commitment, *etc.* Thus, intrafamily interaction and the structure as the essence of interactions can be described in a naturalistic way through ordinary language that can be easily documented in psychotherapy sessions (Table 1). The psychopathological relevance is that in every interaction, not only an intertemporal balance of the integral of interpersonal give and take but also of intrapersonal give and take must be established to produce harmony and avoid conflict, which in any mental disorder are at least accelerators of pathogenetic mechanisms.

This notion of balance and imbalance of interactions is in turn linked to the well-known and highly integrative and heuristically fruitful concept of stress.

### ***Stress as a central construct – an ecological conceptualization***

A relation theoretical framework for stress theory can be reconstructed through an imbalance of four relations between needs (desires) and competencies of the person and offers and barriers of the environment: (1) The person’s needs (desires, demands) in relation to their (2) competence to satisfy these needs depends on the (3) environment’s offers in relation to these needs, and in relation to the (4) environment’s barriers. For example, related to the person: I want roses in my room (desire), because roses are beautiful (offers), but they have thorns (barriers). If I have a tool (competence), I can cut them and put them in a vase at home.

Although this concept could be elaborated further, this example is meant to illustrate the ecopsychological perspective. A relational stress concept is also appropriate at the biological level: The probability of an infectious disease is determined by the relationship between the infectivity of the pathogen agent and the vulnerability of the host and their respective embeddedness in their environments.

Seen in this light, the fruitful bio-psycho-social conception of the stress paradigm can be combined with an ecological perspective, including for a relational/ecological understanding of addiction.

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## **CONCLUSION**

For a comprehensive picture of mental health, the constitution of a “systemic ecology of the person” is crucial. Within this theoretical project, the interdisciplinary reconstruction of the concept of “relations” seems to be essential. The focus is on the quality of the relation between the person and the (social) environment, as they are conceptualized by various theoretical approaches/constructs such as “vulnerability”, “resilience”, “salutogenesis”, “risk factors”, “protective factors”, “affordances”, “asymmetries”, “barriers”, “incongruences”, “attachment”, *etc.* Psychoanalysis, especially object relations theory, has a rich repertoire of descriptions of these relational terms[140]. Finally, the relationship between the subjective perspective (“I am observed by secret service”) and the objective perspective on the world (“there is

Table 1 Exchange forms and contents—some basic examples

Give	Content	Take
Give out	Rejection	Accept
Spend	Money, time	Receive, consume
Give away, devote to	Burden	Accept
Offer	Care	Demand
Give	Money	Accept
Give away	Furniture	Accept
Send	Information	Receive

very likely no interest of secret service”) is a crucial issue for psychiatrists and psychotherapists to work on.

It is important to conclude this paper with the position of Kirmayer and Crafa[21]: “This ecosocial view of mind, brain, and culture calls for a shift in perspective from a psychiatry centered on brain circuitry and disorders toward one that recognizes social predicaments as the central focus of clinical concern and social systems or networks as a crucial site for explanation and intervention.”

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