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TRANSDISCIPLINAR APPROACHES IN UNDERSTANDING ADDICTIONS

***Aurora Carmen BARBAT*[1]**

Abstract

This study attempts to underline the relationship between natural sciences and humanities when analyzing the complexity of drug use and addictions phenomenas. The qualitative method used in this paper is based on a phenomenological approach. Trying to answer if addicts are victims of their own biology, we will analyze the biological factors involved in addiction, showing that information represents the base of epigenetic and psycho-neuro-immunological realities. Corroborating these dates with Thomas von Aquinas' perspective about soul-body connections, we will conclude by underlying the importance of an integrative dialogue between sciences when speaking about addiction. The future of research in addictions reclaims not only multidisciplinarity, but its own transdiscilinar roots in an early dialog of disciplines.

Keywords: addictions, transdisciplinarity, communitarian therapy, social work.

Introduction

Education for health has to be a non-theoretical phenomena. Universities nowadays are living in an academical world of specialists. But actually the specialists know more and more about less and less. And it seems to be that the old ideal of unified knowledge loses again its power and creativity: the richer our information and knowledge are, the poorer become our ability to orient ourselves in finding efficient solutions (Corici, M., 2009; Corici, M., 2010).

Great achievements needs not only specialized knowledge from various areas but close contact with other pluridisciplinar specialists: Gottlob Ferge was a mathematician and philosopher, Max Weber a sociologists and historian, Max Delbrück a biologist and a physicist (Mittelstrass, J., 2006). Many psychotherapists in the catholic world have degrees in both psychology and theology, elite medical doctors are trained in psychology and high standard social workers have a complementary degree in psychology or applied theology.

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The paper will focus on the psycho-neuro-biological scientific aspects about addiction, trying to summarize these datas for the use of nonmedical therapists and educators. In shaping this, the phenomenological approach will be followed by an hermeneutical analyze, also corroborating the author's experience in interviewing: members of Alcoholics Anonymous self-group (Timisoara, Romania, 2016); (ex) addict people from therapeutic communities such as "Cenacolo" (Bosnia Herzegovina, 2009) and "Teen Challenge" (Timisoara, Romania, 2017). The scientific literature will include a thematic synthesis of medical studies, German psycho-theological literature and European bioethical journals.

Preliminary considerations about health and addiction

According to WHO definition of health: **„**Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (Constitution of WHO, n.d.). Trying to integrate this restricted WHO definition into a multi- or transdiciplinar perspective, we should begin by remembering some basic physiological aspects: (1) Our corporeal dynamic processes leads to the fact that each moment, within us, a lot of new cells are born whereas other die; (2) In every second we are confronted with millions and millions of bacteria, viruses, and cancer cells whereas our immune system recognises them as ‚non-self' and constantly destroy them; (3) More than that, each of us possess ca. 10 dangerous genetically mutations but nevertheless our epigenetically processes inactivate them properyl.

In a certain sense, the immune system represents the so called *soul of the organism* or the *silent wonder* influenced by the big data of our ca. 25.000 genes. In this way, we can preserve our health during our life cycles. Consequently, as scientists show, health consists in a tremendous individual struggle in order to acquire new and new balances. In other terms, *health is a habitus, and not a status*: it has to do with harmony, unity, and integrity. In analyzing addictive/ dependence realities**,** one of the most comprehensive definitions is given by DSM-5: "People with substance related and addictive disorders may have their perception, cognition or physiology debilitated in reversible or irreversible ways. They may continue to use these substances even when they experience clusters or negative effects. And they may become so dependent on a substance that even when they try to cease or reduce their use, they experience additional behavior or cognitive consequences. [...] and the individual with these disorders continue their use and behavior whether or not they recognize it as a problem" (DSM-5).

A complementar understanding of the additive phenomena is offered by the American Society of Addiction Medicine: *"Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. …Addiction is characterized by inability to consistently abstain,*

impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response" (Boston University School of Social Work, n.d.). If psychotropic substances are the most common sources of addiction (alcohol, nicotine, illegal drugs, and prescription drugs), there are a wide range of behavioral addictions such as food, gambling, sex, pornography, shopping, theft, video games, work. People addicted to substances often experience significant physical consequences. Those who develop behavioral addictions may not exhibit obvious physio-pathological phenomena, but the challenges associated with the complexity of their treatment cannot be underestimated. *Long time overdue (due to long-standing historical, and barriers), mental health and addiction services have now to be integrated, since psychiatrical comorbidity are often demonstrated.*

Biological and neurochemical facts in understanding addiction

The synapse

Our brain is a huge and still unknown csignaling network, with neurons forming the basis of that system. Electrochemical signals flow in one direction in neurons. The connections between the ends of the neuron and of (perhaps thousands) of other neurons are called synapses. A synapse receives, processes, and transmits information through electrical and chemical signals (Best, n.d.) (*Figure 1*).

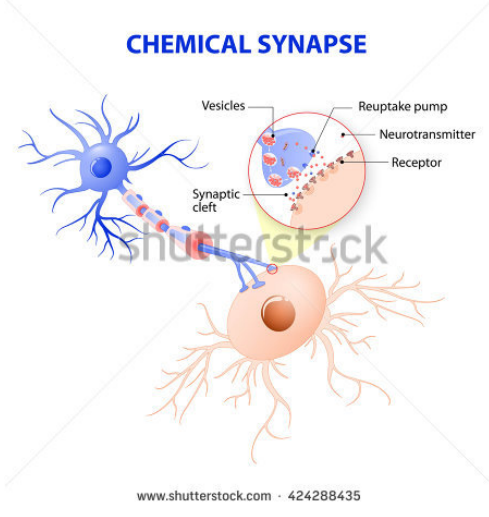


Figure 1. The chemical synapse (the gap junctions between neurons) (Source: https://www.shutterstock.com/image-vector/neurotransmitter-release-mechanisms-neurotransmitters-packaged-into-424288435?src=hZy3f0pc0PHdQARNID3yjQ-1-33)

Neurotransmitters represent endogenous substances that enable the neurotransmissions from one neuron to another neuron (or to a neuromuscular junction, muscle cell or gland cell). These chemicals are released from some synaptic vesicles of the presynaptic neuron, through a intersynaptic space, into the postsynaptic neurotransmitters receptors. Neurotransmitters play a huge role in shaping each neurocerebral functions, being synthesized from aminoacids: "Their exact numbers are unknown, but more than 100 chemical messengers have been uniquely identified" (Wikipedia, 2017). Among these, the most important are glutamic acid, GABA, vasopressin, somatostatin, neurotensin, norepinephrine, dopamine, serotonin, and acetylcholine.

The reward pathway in the brain exists longer than humanity and is situated within the ancient brain centers: "[…] that control many basic functions, most of them unconscious, that people share with animals. […]. Although each drug employs it in a somewhat different way, addictions center around alterations in a single pathway in the brain: the 'reward' circuit whose chief centers of action lie in the ancient part of the brain known as the limbic system. […] And perhaps - a big perhaps because addiction experts are divided on this point - the pathway also figures in 'addictions' that do not involve drugs, for example, the compulsive and destructive pursuit of eating, exercise, gambling, or sex" (Powledge, 1999). For a better understanding of the reward cerebral structures, we can examine *Figure 2*:

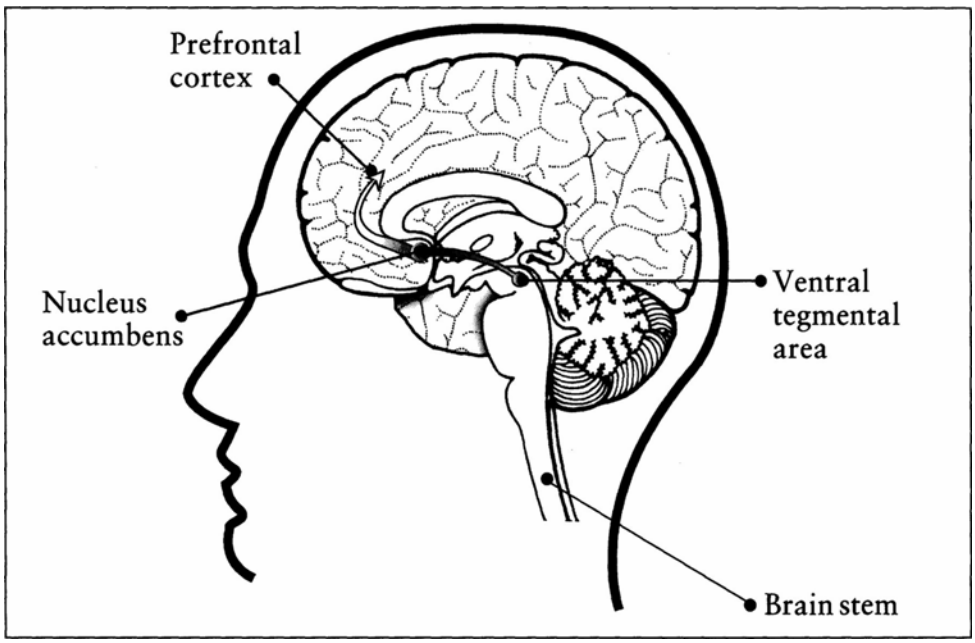


Figure 2. Cerebral structures involved in the addiction pathway (Powledge, 1999)

The most important structures involved in the addiction pathway are: (1) the nucleus accumbens, which connects with many other brain structures, such as the limbic system (the so-called emotional brain, in evolutionary terms very old), and (2) the prefontal cortex, involved in cognitive superior functions tasks such as memory, planning, affectivity, attention, social behavior.

Scientists believe, however, that the reward pathway exists for reasons more fundamental than fun, since it contain molecules that normally interact not with drugs but with the chemicals that evolution has designed for them (Ibidem). "Most of the neurochemical processes leading to addiction and relapse are still poorly understood but might bear implications for the future design of pharmaceuticals for treatment of addiction and relapse prevention" (Ende, G., Sack, M., 2013).

What do we know for we certain is that psychotropic drugs are capable to modify drug permeability in the central nervous system (across blood- brain and blood- cerebrospinal fluid barriers). As a result they are able to: "Flood the brain with excess neurotransmitters. Stop the brain from making neurotransmitters. Block neurotransmitters from entering or leaving neurons. […] Increase the number of receptors for certain neurotransmitters. Make some receptors more sensitive to certain neurotransmitters […] (Hazelden Betty Ford Foundation, 2001).

Concluding these chapter, we understand that the addiction pathway is within the brain system that governs motivated behavior, known as *reward region*. What follows is a selective account of complex and still undiscovered dizzyingly process of addiction.We can also reaffirm Ernst Haeckel's affirmation that ontogeny recapitulates phylogeny.

Genetical influences of addiction

Through complex and controlled mechanisms, our genes are responsible of producing specific proteins within each cell. The production of these proteins creates a unique design (blueprint) that shapes every human feature: weight, hair color, predispositions, behavior etc. But our genetic blueprint is vulnerable, and chance mutations in genes can produce hereditary diseases or hereditary predispositions to some diseases.

Addictions may be inherited, as a result from changes in genes. Anyway there is no one single modified gene responsible from addiction and genes that are involved can vary from person to person. This is why the effort to locate these genes (gene markers) represents an overwhelming task. „Two major methods of investigating the inheritance of alcoholism are studies of twins and of adoptees. Twin studies compare the incidence of alcoholism in identical twins with the incidence of alcoholism in fraternal twins. If there is a genetic component in the risk for alcoholism, then identical twins, who have identical genes, would be expected to exhibit similar histories of developing alcoholism (or not developing alcoholism). Fraternal twins, who are genetically different individuals born at the same time, would be more likely to differ in their tendencies to develop alcoholism.

In general, researchers using the twin method have found these expectations to be true" (The Genetics of Alcoholism, 2000).

Brain waves may predict risk for addiction

Ca. 20 years ago, Begleiter (State University of New York in Brooklyn) has discovered another possible marker in the brain waves of people from alcoholic families: a lowered P3 amplitude of EEG. This particularity has been discovered even by those who have been abstinent for up to 10 years, in non-alcoholic relatives of alcoholics, including their children. „Studies conducted so far suggest that there are several common substrates (e.g., theta oscillations, beta oscillations, P3 amplitude) that are influenced by alcohol in both acute and chronic use and this in turn may reflect the underlying vulnerability of the brain to alcohol. [...] Prospective studies of young individuals with ‚risk genotypes' can lead to an improved understanding of how neural and cognitive changes contribute to susceptibility across development, which in turn can lead to the design of well-targeted prevention initiatives" (Porjesz, B., Rangaswamy, M., 2014).

It is important to understand that some people use drugs occasionally and remain occasional users, whereas others progress inevitably to addiction. Even when researchers don't understand completely the biochemical processes of addiction, they outline that heredity plays a certain role.

Epigenetical and immune mechanisms of drug addiction

Epigenetic is the study of heritable changes in gene function that do not involve DNA molecules. The Greek prefix *epi-* (over, outside of, around) suggests that epigenetical mechanisms act „above" the chromosomial constellation. Epigenetic examines the source that activates gene expression or suppression, focusing on the signals that turn genes on and off. Some of those signals are *chemical*, while others are *electromagnetic,* coming from both internal and external environment (inside the body, or surrounding it). Early childhood experience, affection, spirituality, environmental situation, distress, nutrition, electromagnetic shifts etc. are in this way capable to influence our genotype (genetic inheritence) by shaping our phenotype (the lived expression of our genotype).

Understanding that life experiences is changing all the time, the epigenetic regulation turns out to be the mechanism through which we change along with it. Studies of epigenetic mechanisms of addiction provides a important perspective about genetic and non-genic regions that are affected by repeated drug exposure: "Drug addiction involves potentially life-long behavioral abnormalities that are caused in vulnerable individuals by repeated exposure to a drug of abuse. […] In several instances, it has been possible to demonstrate directly the contribution of such epigenetic changes to addiction-related behavioral abnormalities" (Nestler, E.J., 2014).

But even some *immune complexities* influences addictive mechanisms. And such discoveries will point us in the direction of successfully addiction therapy: „It is hoped that by combining the collective wisdom of neuroscience, immunology and pharmacology, into Neuroimmunopharmacology, we may more fully understanding the neuronal and immune complexities of how drugs of abuse [...] create their rewarding and addiction states" (Hutchinson, M.R., and Watkins, L.R., 2014).

'Soul' and 'body' dialogue: epigenetic and pharmacogenetics engage information

But if the genetically influences are from decades accepted, the neurochemical impact of our life style and human relationships is relative new and explained in the terms of information. Information as health's keynote can realize a symphony of relations: within our self (as individum or person), between persons, between person and his ambient, and when needed, between person and therapist.

Understanding epigenetic and psycho-neuro-immunology, we can also understand how stable changes in behavior can adjust brain function. That is why therapists strongly reccomended addictive patients to avoid people, places, and things that they used to associate with consuming. This new behavior is able to weaken the previous link between drug consuming and pleasure that's been encoded in the brain. Many centuries ago, a catholic priest and a Dominican brother, Thomas von Aquinas (1225 –1274) use to express his philosophical conviction regarding the dialogue between soul and body in his well know statement: *Anima forma corporis (The soul forms the body).*

Actually, after almost 8 centuries, the natural science can prove that information is the key that decide the physiological processes: a splendid concordance between Aquinas' thought and the scientific knowledge about how (in)formation influence the (epi)genetical mechanisms, according to the intimate psychological life and ambiental factors. Thus *Anima(in)forma corporis* seems to be not a happy vocabulary construct, but a scientifically fact (Beck., M. 2008; 2017). The figure bellow is resumimg our above ideas (*Figure 3*).

Analysing the figure, we should (re)affirm that the market preference of the *Zeitgeist* (spirit of the time) for a divided self has to stop if we really want to restore clarity in teaching health, disease and disorders concepts in a comprehensive and integrative meanings.

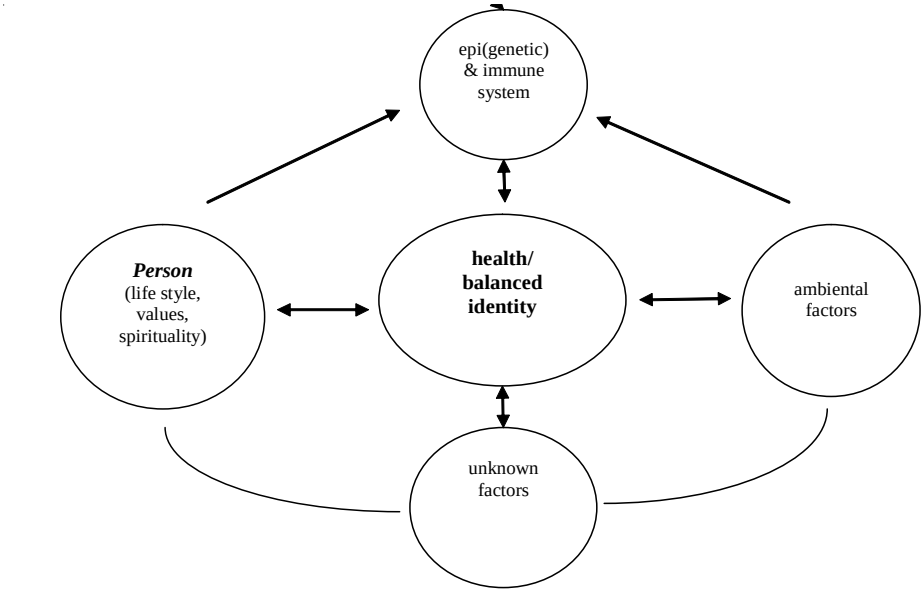


Figure 3. Parameters of health – integrative approach

Addiction social worker tasks

As we have already understood, concepts like health and ilness/sickness cannot be reduced to biology, hygiene or pure faith (destiny). A complexe and valid definition needs philosophical and theological approaches, too: „University research and training will only flourish under global conditions in those places where universality, transdisciplnarity, identity in plurality, and equality are assured. If this is not the case, the paradigm of the schools replaces that of the university" (Mittelstrass, J., 2006, 181). In trying to be a successful addiction social worker, the clinical social worker has to combine knowledge of mental and behavioral disorders, substance abuse, with expertise in the areas of assessment and treatment (Buzducea, 2017; Jurca, 2016; Tranca, 2015). Consequently his/her actions consist in interventions that help clients/patients to overcome their addictions and return to healthier living lives.

Sharing knowledge about biochemical processes of addiction, as well as integrating them within a psycho-philosophical approach will reshape - when needed - an insufficient curricula of interrelated disciplines concerning addictions. (Balauta, Vlaicu, 2017) In principles, the social worker will engage his activity knowing that his client might use pharmacological and behavioral means. He will base the activity on prevention, family counseling and group therapy meetings, social services, rehabilitation, and self-help groups. From time to time, he needs

to be able to survive his own distress in trying to cope with: (severe) depression and suicidal ideation; aggressiveness; eating disorders; behavioral addiction; intentional or accidental overdose; runaway or other related behavioral problems; truancy and school failure; HIV related consequences; unexpected pregnancies; isolation; loss of motivation; disturbed self idea; legal problems (even incarceration); dangerous codependence symptoms at family members and friends.

Identifying clients's areas of concern, and developing a treatment plan in partnership with them and their family will be the current social work activity in residential treatment centers, outpatient clinics and therapeutical communities (Neamtu, 2011). A genuine dialogue and collaboration with other therapists (physicians, psychotherapists, spiritual counsellors, juridical cousellors), family member and educators will shape the efficient case management profile (Neamtu, 2003; Neamtu, Toma, 2010).

Conclusions

Mental and addiction social worker need a specialised curricula and systematic training modules. (Goian, C., Vlaicu, F. L. & Balauta, D. S., 2014). The future of research and academicals learning are transdisciplinarity and the early integrative dialog of disciplines. Concerning the spiritual needs of patients, the (intelligent) unbeliever therapists should admit that what is unknowable need not to be unbelievable. Consequently, the therapists should respect the faith of his/her clients/patients. The task of good universities is to make more explicit connections between disciplines, as well as connections between science theory, research and scholars:

If we won't achieve this, the crisis of confidence in which we are – whether deservedly or undeservedly - will continue: „When knowledge, information and orienttaion draw apart, when the market becomes the measure of all things and Man withdraws behind his economic goods, education becomes a concrete utopia. It becomes the future of a knowledge society that no longer disposes of an integral concept of knowledge" (Mittelstarss, J., 2006, 173). Keeping high standards in health prevention remains a delicate balance between the ethical/moral own responsibility and the societal ambivalence.

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