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Some remarks and terminological considerations on the addiction concept

by

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Synopsis: While there are many working definitions of addiction, the essence of the construct is still not clear. Consequently, addiction remains an imprecise concept. Recognizing the semantic problems, it is suggested that, while seeking a strict operational definition, one should also keep in mind that the comparison of different study results with different methodological methods is bound to be problematic.

1. On the concept of addiction:

The following article is based on conducting scientific studies for many years regarding the addiction phenomenon and on a recently published book by the author (GIACOMUZZI 2008).

While there are many working definitions of addiction, the essence of the construct has remained elusive. Consequently, addiction remains still an imprecise concept or phenomenon (SHAFFER 1999). Approaching the twenty-first century, many important addiction-related issues remain therefore unresolved (GIACOMUZZI 2008). In many ways, current definitions incorporate only the most superficial levels of our understandings of addiction. It seems that researchers and clinicians alike are still uncertain about what they mean by the concept of addiction. However, in general, the term addiction is often synonymous with (substance) *dependence* (2008).

In the absence of an understanding of this concept, neither scientists nor clinicians will know what to do with either the neurobiological or clinical discoveries of the future. While this may seem like a simplistic conceptual concern, the author of this work is quite certain that there is nothing at all simple about it (GIACOMUZZI 2008). More objective, underlying neuropsychobiological dysfunctions – such as disrupted chemical balance in the brain – are not taken into account, largely because they cannot easily be clinically assessed.

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In this contribution the concept of addiction and terminological considerations regarding the term addiction are discussed and current addiction theories as well as new approaches in addiction research are outlined (GIACOMUZZI 2008).

2. Terminological considerations:

Discussing the addiction phenomenon presents us with a terminological minefield (GOSSP 1996, WHO 1957, 1964). The term addiction is often commonly used. Many dislike this term because it can convey physical forces that compel the individual to be out of control, and can imply a pre-determined individual condition, divorced from the environment (GOSSP 1996). Considerable confusion exists also regarding the nature of addiction. It is critically important to understand the meaning of this term because of its clinical relevance to the management of addiction.

The World Health Organisation (WHO 1957) defined drug addiction as *a state of periodic or chronic intoxication, detrimental to the individual and to society, produced by repeated consumption of a drug (natural or synthetic)*. Its characteristics include: 1: *an overpowering desire or need (compulsion) to continue taking the drug and to obtain it by any means*; 2: *a tendency to increase the dose*; and 3: *a psychic (psychological) and sometimes physical dependence on the effects of the drug*. Within this definition some drugs (e.g. heroin) are physically addictive, and there is a potential for most other drugs for psychological addiction.

In its 13th report the World Health Organisation Expert Committee On Addiction-Producing Drugs strongly recommended that the term drug dependence, defined as *a state arising from repeated administration of a drug on a periodic or continuous basis*, should be the preferred nomenclature instead of the term addiction (WHO 1964).

However, today the term *addiction* is still in use by the scientific community. Regarding the nature and meaning of addiction, it is suggested that addiction in scientific literature should be seen more as a generic concept.

Even the names of scientific journal in this research field are pretty evenly split. Dependence should be considered as a more clinical/scientific construct to be used rather in the context of treatment. This is in agreement with Shaffer and others (SHAFFER 1999).

However, the use of the term addiction by the public and scientific community is very often synonymous with (*substance*) *dependence*.

3. Psychical and physical considerations:

In the 1960s, pharmacologists identified two kinds of drug dependence, physical and psychic. Physical dependence as an *inevitable result of the pharmacological action of some drugs with sufficient amount and time of administration*. *Psychic dependence*, while also related to pharmacological action, as a more particularly a manifestation of the individual's reaction to the effects of a specific drug and varies with the individual as well as the drug. In this formulation, psychic dependence is *the most powerful of all factors involved in*

chronic intoxication with psychotropic drugs . . . even in the case of most intense craving and perpetuation of compulsive abuse (EDDY et al.1965).

CAMERON (1971) specified that psychic dependence is ascertained by how far the use of drugs appears (1) *to be an important life-organizing factor* and (2) *to take precedence over the use of other coping mechanisms*. Psychic dependence, as defined here, is central to the manifestations of drug abuse that were formerly called addiction. Jaffe totally avoided the term dependence. As defined by JAFFE (1980), drug addiction is *a behavioural pattern of drug use, characterized by overwhelming involvement with the use of a drug (compulsive use), the securing of its supply and a high tendency to relapse after withdrawal. In addition, it is characterized by craving, withdrawal and tolerance*. In recent years, the concept of addiction has not only a biological component precipitated from substance abuse, but also includes cultural, social, and cognitive or psychological influences. It represents a pattern of coping through habituation. Rather than being a distinct disease entity, it is regarded more or less as a continuum of feeling and behaviour.

A recent definition by the Commission of Public Records defines *addiction* as a neurobehavioral syndrome with genetic and environmental influences that results in psychological dependence on the use of substances for their psychic effects and is characterized by compulsive use despite harm (COMMISSION OF PUBLIC RECORDS 2003, AMERICAN ACADEMY OF PAIN MEDICINE AND THE AMERICAN PAIN SOCIETY 1997). Addiction continues to be referred to by terms such as *drug dependence and psychological dependence* (FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES 1998). The traditional distinction between addiction and habituation centers on the ability of a drug to produce tolerance and physical dependence.

Tolerance is a physiological phenomenon that requires the individual to use more and more of the drug in repeated efforts to achieve the same effect (PORTENOY 1994). Physical dependence manifests itself by the signs and symptoms of abstinence when the drug is withdrawn. A classic feature of physical dependence is the abstinence or withdrawal syndrome. If the addict is abruptly deprived of a drug upon which the body has physical dependence, there will ensue a set of reactions, the intensity of which will depend on the amount and length of time that the drug has been used (PORTENOY 1994).

Physical dependence and tolerance are normal physiological consequences of extended opioid therapy for pain and should not be considered addiction (AMERICAN ACADEMY OF PAIN MEDICINE AND THE AMERICAN PAIN SOCIETY 1997; COMMISSION OF PUBLIC RECORDS 2003).

Addiction is currently also defined as a *behaviour* over which an individual has impaired control with harmful consequences (COTTLER 1993). Thus, individuals who recognize that their behaviour is harming them or those whom they care about find themselves unable to stop engaging in the behaviour when they try to do so. The severity of the medical, psychological and social harm that can be caused by addiction, together with the fact that it violates the individual's freedom of choice, means that it is appropriate to consider it to be a disorder of motivation (WEST 2001).

A very commonly used reference text from the American Psychiatric Association – the Diagnostic and Statistical Manual of Mental Disorders – does not use the term addiction at

all; rather, it uses *substance dependence* (APA 2000). And, to be more precise, the particular drug involved is specified: e.g., heroin dependence, alcohol dependence, etc.

Substance Dependence is considered in the Diagnostic and Statistical Manual as a maladaptive pattern of substance use leading to significant impairment or distress in three (3) or more of the following 7 areas during a 12-month period:

1. Tolerance – defined by either: a) a need for increased amounts of substance to achieve intoxication or desired effects, b) diminished effect with continued use of the same amount of substance.
2. Withdrawal – evident by either: a) characteristic, uncomfortable abstinence signs/symptoms for the particular substance, b) the same (or closely related) substance is taken to relieve or avoid the withdrawal syndrome.
3. The substance is used in greater quantities or for longer periods than intended.
4. There is a persistent desire or unsuccessful efforts to cut down or control substance use.
5. Considerable time and effort are spent in obtaining or using the substance or in recovering from its effects.
6. Important social, employment, and recreational activities are given up or reduced because of an intense preoccupation with substance use.
7. Substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or worsened by the substance. For example, depression caused by cocaine, or an ulcer made worse by alcohol.

However, even today, the term substance dependence is not used generally. Instead, some authors in the fMRI (functional Magnetic Resonance Imaging) research use also terms such as substance addiction (AMEN 2001, DOLAN 2002). Using advanced techniques, scientists have been able to conclusively demonstrate that there are chemical, anatomical, and functional changes in the brains of substance-addicted persons.

For example, pictures of single-photon emission computed tomography (SPECT) images demonstrate that addiction, as well as mental disorders, affect brain structure (and consequent functioning) just as much as a physical impairment caused by stroke (AMEN 2001). SPECT uses small doses of radioisotope tracers to study regional cerebral blood flow and thus, indirectly, brain function during health and disease states.

The images show the cerebral regions of different patients. Compared with a normal subject, there are severe and multiple disruptions in the brains of these patients. Portions of the cerebral cortex are responsible for executive functions of cognition, judgement, and impulse control – which become critically dysfunctional in mental and addictive disorders. Also, deeper areas of the brain are adversely affected (AMEN 2001). Thus, substance addiction may best be understood as a neurological disease process (DOLAN 2002).

There are a range of factors that influence an individual's reaction to drugs and susceptibility to addiction (GIACOMUZZI 2012). Ultimately, however, theories of addiction need to include not just biological aspects, but also subjective perceptions, cultural, psychologi-

cal, neurophysiological, historical and individual factors, that comprise the complex behaviour known as addiction (GIACOMUZZI 2012).

In addition, newly developed pharmacological strategies offer also new perspectives on addiction treatment and its outcome given by the Quality of Life (QoL) approach (GIACOMUZZI 2003, 2012). These findings and theoretical developments support also the need for a different view of addiction a better definition of treatment outcomes.

4. Addiction theories:

Drug addiction is a complex behaviour, likely to be influenced by genes, environmental factors, and gene-gene and gene-environment interactions. Various aspects of addiction are studied by different disciplines. Animal studies are providing increasing insight into brain regions and genes associated with addiction. Epidemiological studies are establishing the factors increasing risk for initiation and continuation of substance use.

Twin and adoption studies are increasing our understanding of the complex mechanisms involved in substance use, including comorbidity and gene-environment interaction (VAN DEN BREE 2005). Finally, molecular genetic studies in humans are starting to yield some converging findings. It is argued and illustrated with examples that greater awareness of progress in other disciplines can speed up our understanding of the complex processes involved in addiction.

A search of Medline and the Science and Social Science Citation Indexes using the keywords *theory* or *model* together with *addiction/dependence* yielded a host of articles. Theories yielded by the literature search can be classified into five groups (WEST 2001):

- Theories regarding conceptualization and general processes;
- Theories focusing on effect of addictive stimuli;
- Theories considering individual susceptibility;
- Theories on environmental factors;
- Theories focusing on recovery and relapse

The first group involves theories that attempt to provide broad insights into the conceptualization of addiction. Thus addiction may be construed in terms of biological, social or psychological processes, or some combination of these. A second group of theories seeks to explain why particular stimuli have a high propensity to becoming a focus for addiction. The third group of theories focus on why particular individuals are more susceptible to addiction than others. Individuals who are particularly susceptible to the effects of a given stimulus, whether biochemically, psychologically or socially, or in need of those effects, would obviously be expected to be most at risk.

The idea that opioid use caused personality defects was challenged as early as the 1920s by KOLB (1958, 1962), who found that the personality traits observed among addicts preceded their drug use. Kolb's view was summarized in his statement that *the neurotic and the psychopath receive from narcotics a pleasurable sense of relief from the realities of life that normal persons do not receive because life is no special burden to them* (p. 85).

A major difficulty in assessing personality correlates of addiction lies in determining whether the traits found in a group of addicts are actually characteristics of a social group. On the other hand, addictive personality traits are obscured by lumping together controlled users of a drug such as heroin and those addicted to it. Similarly, the same traits may go unnoticed in addicts whose different ethnic backgrounds or current settings predispose them toward different types of involvements, drug or otherwise (PEELE 1985).

A fourth set of theories explore the environmental and social conditions which make addiction more or less likely. Thus situations which lead to a need for the effects of a stimulus or in which those effects take on a greater significance would be likely to promote addiction.

The fifth group involves theories that focus on recovery and relapse. This group cuts across the others in that some are broad perspectives, others focus on effects of withdrawal from particular stimuli such as drugs; still others focus on individual factors and others seek to model environmental influences.

5. Cultural, ritualistic and developmental factors:

A broad spectrum of issues is included in the topic of this section. As a detailed examination of this topic is beyond the scope of this work only a cursory overview will be given providing an insight into the main problems involved. Substance abuse and dependence may undermine certain aspects of ethnicity and ethnic affiliations, by interfering with traditional values, attitudes, preferred behaviours, and interpersonal relationships.

Ethnicity can also be a confusing concept. In part, it includes inherited characteristics such as race. Certain other aspects are learned, such as religion, language, attitudes, values, or customs. National origin can be a component of ethnicity. Group affiliation and participation in certain rituals and ceremonies are also involved in ethnicity (WESTERMEYER 1984).

Substance abuse leads to the evolution of new values, attitudes and behaviours. These are remarkably similar (though not identical) from one chemically dependent person to another. In some cases, the chemically dependent person remains a social isolate, while in other cases the individual joins with others to create a subculture in which the drug or alcohol-centered values, attitudes and behaviours are shared. Treatment for alcoholism or drug abuse – successful – produces crisis in ethnic identity for many people. Drug centered values and behaviours are directly confronted in the treatment process, and affiliation with alcohol or drug subcultures is specifically undermined. This may create a state of anomia-with its attendant confusion, anxiety, and loss. Out of this turmoil, some individuals resume their original, childhood ethnic identities and affiliations (though often more accentuated than before). Others assume new ethnic identities or affiliations (WESTERMEYER 1984).

It is crucial to recognize that – as in the case of opioid use in the nineteenth-and twentieth-century – addictive patterns of drug use do not depend solely, or even largely, on the amount of the substance in use at a given time and place. Per capita alcohol consumption was several times its current level in the United States during the colonial period, yet both problem drinking and alcoholism were at far lower levels than they are today. Indeed,

colonial Americans did not comprehend alcoholism as an uncontrollable disease or addiction (LEVINE 1978). Because alcohol is so commonly used throughout the world, it offers the best illustration of how the effects of a substance are interpreted in widely divergent ways that influence its addictive potential (PEELE 1985).

Heroin for example was transported to the United States through European countries no more familiar with opioid use than was the United States. Yet heroin addiction, while considered a vicious social menace here, was regarded as a purely American disease in those European countries where the raw opium was processed (PEELE 1985). African-Americans are nowadays overrepresented among drug abusers in the United States when compared to European-Americans, and have lower rates of recovery from drug addiction after treatment (BOWSER & BILAL 2001).

There has been no comprehensive research to date to specifically explain either this overrepresentation or lower rates of recovery among African-Americans. BOWSER & BILAL (2001) suggested that one reason for this lack of attention is due to the failure of drug abuse treatment providers and researchers to see race as a cultural rather than physical phenomenon. The authors point out that cultural factors are intrinsic to successful efforts to address drug abuse among African-Americans. The authors showed several historic African-American coping strategies to be powerful factors in client addictive behaviour and barriers to recovery. Through case studies of clients who were successful in their effort to recover, the necessity to address cultural as well as personal issues could be shown by the authors (BOWSER & BILAL 2001).

Different countries and cultures regard, use, and react to substances in different ways, which in turn influence the likelihood of addiction. Thus, opium was never proscribed or considered a dangerous substance in India, where it was grown and used indigenously, but it quickly became a major social problem in China when it was brought there by the British (BOWSER & BILAL 2001). The external introduction of a substance into a culture that does not have established social mechanisms for regulating its use is common in the history of drug abuse. The appearance of widespread abuse of and addiction to a substance may also take place after indigenous customs regarding its use are overwhelmed by a dominant foreign power. Thus the Hopi and Zuni Indians drank alcohol in a ritualistic and regulated manner prior to the coming of the Spanish, but in a destructive and generally addictive manner thereafter (PEELE 1985). Sometimes a drug takes root as an addictive substance in one culture but not in other cultures that are exposed to it at the same time.

Regarding drug abuse in China Zhao, Liu, Zhao, Liu, Liang, Tang, Liu and Zheng (2004) reported in a recent article that the drug problem in China reappeared in the late 1980s. At that time, most drug abusers used opium only, with heroin accounting for a very small proportion, its use being limited to border areas in the southwest and rural areas in the northwest. Beginning in the early 1990s, drug abuse spread quickly. The number of registered drug addicts increased from 70,000 in 1990 to one million by the end of 2002. Besides opioids, some new kinds of drugs including amphetamines and ketamine have penetrated the country through various channels since 1997. In china there are three types

of treatment settings for detoxification and rehabilitation that are available: compulsory detoxification institutions, rehabilitation units through labour, and voluntary detoxification institutions run by sections of public security, justice, and health, respectively.

Medical treatment is often combined with psychological counselling and physical training. Pharmaceutical therapy, traditional Chinese medicine, and no pharmaceutical therapy are utilized for opioid addiction. Drug prevention, especially for young people, is emphasized. NGOs (non-governmental organizations) at different levels have all joined in this work. Intervention work was also started in regions where drug abuse and HIV/AIDS problems are serious.

A published study by PRINZLEVE, HAASEN, ZURHOLD, MATALI, BRUGUERA, GEREVICH, BACSKAI, RYDER, BUTLER, MANNING, GOSSOP, PEZOUS, VERSTER, CAMPOSERAGNA, ANDERSSON, OLSSON, PRIMORAC, FISCHER, GUTTINGER, REHM AND KRAUSZ (2004) investigated patterns of cocaine powder and crack cocaine use of different groups in nine European countries. This Multi-centre cross-sectional study was conducted in Barcelona, Budapest, Dublin, Hamburg, London, Paris, Rome, Vienna, and Zürich. Data were collected by structured face-to-face interviews. The sample comprised 1,855 cocaine users out of three subgroups: 632 cocaine users in addiction treatment, mainly maintenance treatment; 615 socially marginalized cocaine users not in treatment, and 608 socially integrated cocaine users not in treatment. The study evaluated the use of cocaine powder, crack cocaine and other substances in the last 30 days, routes of administration, and lifetime use of cocaine powder and crack cocaine.

The marginalized group showed the highest intensity of cocaine use, the highest intensity of heroin use and of multiple substance use. 95% of the integrated group snorted cocaine powder, while in the two other groups, injecting was quite prevalent, but with huge differences between the cities. 96% of all participants had used at least one other substance in addition to cocaine in the last 30 days. The use of cocaine powder and crack cocaine in this study varied widely between different groups and cities.

The study is a good example for the fact that multiple substance use is the predominating pattern of cocaine use, and that different routes of administration have to be taken also into account.

Another example regarding drug abuse in different countries and cultures is given by the example of South Africa. A broad range of globally abused substances is present in South Africa and the use and burden of illicit substances appears to be increasing. PARRY, BHANA, PLUDEMANN, MYERS, SIEGFRIED, MOROJELE, FLISHER & KOZEL (2002) described in their paper the South African Community Epidemiology Network on Drug Use (SACENDU), trends and associated consequences of alcohol and other drug (AOD) use in South Africa from January 1997 to December 1999 and outlined selected policy implications identified by SACENDU participants. The authors found that over time alcohol has been the most frequently reported primary substance of abuse across sites. Trauma and psychiatric data highlighted in their study the burden associated with alcohol abuse. Cannabis and Mandrax (methaqualone), alone or in combination, were the most frequently

reported illicit drugs of abuse, generally comprising the largest proportions of drug-related arrests, drug-related psychiatric diagnoses and drug-positive trauma patients (PARRY, BHANA, PLUDDERMANN, MYERS, SIEGFRIED, MOROJELE, FLISHER & KOUOL 2002).

6. The Maturing out phenomenon:

Heroin consumption and of course alcohol addiction are not necessarily a life sentence. Many addicts mature out of their addiction. In the literature, there are reports of spontaneous remission that demonstrates that even the most chronic addicts can get rid of their addiction when their circumstances change, (e.g. new partner/child/job/perspective on the world, fed up with lifestyle/being arrested/having no money/having no relationships with family/friends/children etc). This relates primarily to ideas around addiction pathways and undermines simplistic ideas of addiction being primarily bio-chemical in nature. People's reactions to, need for, and style of using a drug change as they progress through the life cycle. The classical form of this phenomenon is maturing out (WINICK 1961, WALDORF 1973, WALDORF & BIERNACKI 1980, SCHNEIDER 1994, GIACOMUZZI et al. 2005).

The first evidence in support of natural recovery came from Charles Winick's famous maturing out study. WINICK (1961, 1962) originally hypothesized that a majority of young addicts leave their heroin habits behind when they accept an adult role in life. Winick traced the official records of addicts in files of the Federal Bureau of Narcotics and found that age was associated with such traces. Around the age of 35-40 years, addicts tended to drop out of the files, which suggested to Winick that some life cycle processes were involved. He postulated that addicts gave up their addiction just as some adolescents matured out of juvenile delinquency.

However, WALDORF & BIERNACKI (1980) argued that Winick did not know exactly what happened to persons who were no longer in the file and assumed that they had given up their addiction. But this might not be the case.

A 1973 report of George Vaillant's longitudinal study of 100 New York addicts (originally admitted to Lexington Hospital and followed up for 20 years) questions Winick's assumption of recovery. Vaillant found that " . . . *more than half of the actively addicted men of [his] study [were] able to go for five years or more without being reported to the Federal Bureau of Narcotics and Dangerous Drugs,*" and that "*Over 25% of active addicts went for five years without being reported to the New York Narcotics Register*" (VAILLANT 1973). These data suggest that Winick's assumption of recovery may not be completely justified (WALDORF & BIERNACKI 1980).

Another study to suggest natural recovery was conducted in 1964 and 1965 by Robert SCHARSE (1966). Robert Scharse asked known addicts in the programme to identify and locate friends who had used heroin with them but had since given it up. Scharse identified 71 ex-users by this means and interviewed 40 of them in a dual interview situation (both the addict and the ex-user). He found that at least 9 of the 40 interviewed reported that they had experienced physical dependence from heroin and had recovered without undergoing treatment.

Social survey data amplified the exploratory studies of SCHARSE and WINICK in 1967. ROBINS & MURPHY (1967) published results of a social survey of a sample of black males born during 1930-1934 in St. Louis and who attended schools in that city. This was the first study of drug use of a non-treatment sample (called normal by Robins & Murphy) and the authors found that 10% (22) of the 235 men interviewed had been addicted to heroin while 4% (9) had undergone drug treatment. Of the 22 persons reporting heroin addiction, only 16% (4) reported heroin use during the previous year (1964-1965); 2 of the 4 undergone treatment (or 22% of the 13) and the remaining (15% of the 13) had not been treated. In other words, 78% of the treated and 85% of the untreated addicts reported no heroin use for the previous year. (ROBINS & MURPHY, 1967) These findings were so unusual and so much at odds with the accepted knowledge of addiction at the time that many persons were cautiously sceptical.

This scepticism subsided in 1974 when ROBINS, DAVIS & GOODWIN (1974) published their milestone study of returned Vietnam veterans. Startled by reports of widespread heroin use in Vietnam during the war, the federal agencies (more specifically the Special Action Office for Drug Abuse Prevention) commissioned a study of returned veterans in 1972 to learn more about their drug use in Vietnam and also since returning. A sample of 898 men who had returned from Vietnam during September 1971 were interviewed in 1972 for 8-12 months after their return. Of the 898 it was found that nearly one in two had used narcotics in Vietnam (45%) and one in five (20%) had been addicted to heroin. After returning only 10% reported using narcotics between the time of their return and the interview and only 1% had been re-addicted. At the time of the interview, only 2% (8% of those addicted in Vietnam) reported to have been currently using narcotics and in 1% use of opioids was identified through urine analyses. Research findings on the differences between treated and untreated addicts were not as expected. Veterans who did not get treatment for their addiction did just as well upon return as those who were treated. More specifically, the study found that 37% of the treated and 49% of the untreated veterans who were dependent and detected narcotics users (186) were drug positive at the interview. 48% of the treated and 24% of the untreated veterans who were dependent but not detected narcotic users (76) were drug positive and; 13% of the treated and 16% of the untreated persons who claimed never to have been dependent in Vietnam (12) were drug positive (ROBINS et al. 1974).

The idea that addiction was nearly always a long-lasting phenomenon and the old myth, *once an addict, always an addict* had to be abandoned in the face of these findings. Very clearly, the natural history of addiction had to be re-thought to account for these new data. WALDORF (1973) affirmed the occurrence of substantial natural remission in heroin addiction, emphasizing the different forms it assumes and the different ages when people achieve it. It does appear, however, that heroin use is most often a youthful habit.

In 1976 John O'Donnell and co-researchers published preliminary results from a survey of 2,510 males made in 1974 and 1975 (O'DONNELL et al. 1976). From a sample of all the males in the United States born between 1944-1954 and known to draft boards, O'Donnell and his associates found that 6% of the sample had used heroin and 2% were

considered heavy users (using 100 times or more). Only 20 of the heroin users reported going for treatment; this number constituted 13% of all the heroin users. Half the heavy heroin users had undergone treatment. Comparing those who had been to treatment with those who had not, the authors found major differences in current heroin use (use during 1974 and 1975): 65 percent of the men who had been treated for heroin use were currently using it, in contrast with 27 percent of the men who had never been treated for use of heroin. These data suggest that users who enter treatment comprise those least likely to succeed in terminating the use of heroin (O'DONNELL et al. 1976).

WALDORF & BIERNACKI (1980) criticized that O'DONNELL et al. (1976) did not organize their data on the current use of treated and untreated users into addicts or non-addicts, heavy or light users. As a result, it is not possible to tell from their presentation the extent of the prior heroin use of the non-treated sub-sample. WALDORF & BIERNACKI (1980) stated that it could be that the majority of the non-treated users were light or experimental users rather than heavy users or addicts.

Still other sources of data that suggest natural recovery are two large-scale treatment evaluation studies that employed control groups. These studies are the Macro Systems, Inc., evaluation of the New York City Addiction Services Agency (A.S.A.) programmes and the Burt Associates study of the effectiveness of the National Treatment Association (N.T.A.) of Washington, D.C.

The first evaluation conducted by Macro Systems, Inc. (1975) followed up a sample of 462 persons who had been to a variety of A.S.A. treatment programmes (during the last 6 months of 1971). One-third of the sample (156) were persons who had stayed in treatment less than 10 days (and had not undergone any subsequent treatment); this group was designated as the control group (MARCO SYSTEM 1975). Three years after entry in treatment the evaluation findings showed that narcotics use by the control group was no greater than it was for those who had been to treatment. Using an index of narcotics use as a basis of comparison they found that the controls had a score of 0.29 while those in treatment from 10-90 days had 0.21 and those persons who had been in longer than 90 days had a score of 0.20. The differences between the three scores were not statistically significant.

The authors summarized that the findings could have an iconoclastic tenor insofar as they challenge widely held orthodoxies and substantive implications for the future course and direction of drug treatment efforts. The findings, however, are not consistent with theories related to the natural history of addiction, the healing effect of time, and the inner psychological motivation of drug users (MARCO SYSTEM 1975).

These assertions must be tempered, however, in light of some methodological problems with the study. Macro Systems had a low interview completion rate - they initially claimed to have had completed interviews with 74% of the sample but a subsequent report indicated a much lower completion rate of only 61% (BURT ASSOCIATES 1977). The researchers had considerable difficulty in locating and interviewing Puerto Ricans in the sample, particularly those living in the South Bronx, and as a result, Puerto Ricans were underrepresented in the interviewed group and this may have biased the findings.

BURT ASSOCIATES (1977) in their evaluation of the National Treatment Association programmes used a similar design in that they also employed a control group. They successfully located and interviewed 81% of an initial sample of 360 persons who had previously been to treatment one to three years earlier. One-third of those interviewed were persons who had stayed in treatment five days or less and were used as the comparison or control group. One in five (29%) of the total sample were considered *fully recovered* at the follow-up interview, while 37% were considered *partially recovered*. Full recovery was defined by the study as persons who two months before the follow-up interview:

1. used no illicit drugs (except marijuana),
2. had not been arrested or incarcerated and
3. who were employed, in school, or job training or a housewife.

Partial recovery was more complexly defined but usually included one negative response to the arrest and employment criteria or some daily illicit drug use. When the treatment sample was compared with the comparison sample, no significant differences were found between the two. The comparison sample defined as the non-treatment group did just as well in terms of the definitions of recovery as did the treated group. Furthermore, time in treatment had no particular association with outcome; people who stayed in treatment one day did just as well as those who stayed a year, two years, or five years (BURT ASSOCIATES).

Another study to suggest natural recovery came from a longitudinal health study conducted in Central Harlem (New York City) by Ann Brunswick at Columbia University School of Public Health. In 1975-1976, during a second wave of interviews, 535 of the original sample of 668 black youth (18-23 years of age) were interviewed; this was 80% of the original sample. The follow-up interviews revealed that 16% of the sample had used heroin at least once and 13% had used it daily or a *few times a week* at some time in their life (usually during the five year interval between the first and second interview). When respondents were asked about their most recent use of heroin, only 25% of the 69 persons (who used heroin more than twice) reported using heroin in the last year. Organizing the data into those who had received treatment and those who had not, it was discovered that 25% of the treated group reported to have used heroin in the previous year while only 16% of the untreated had (BRUNSWICK 1978).

Compared to the large amount of quantitative, epidemiological drug research - which still is regarded as the *gold standard* of scientific research - done in Germany and Austria, the extent of qualitative research on drugs is small, but increasing since the mid 1980s and of growing importance in the 1990s, focusing in particular on illicit drugs (KEMMESIES 1997). Recent and current qualitative research activities and projects regarding drug use and addiction in general as well as drug demand reduction in particular are supported in Germany by public/governmental institutions like the Federal Centre of Health Education (BzGA – Bundeszentrale für gesundheitliche Aufklärung) or in Austria by the ÖBIG (Österreichisches Bundesinstitut für Gesundheitswesen), complemented by university institutes and work groups, and private/NGO research institutes and associations.

A study by HAPPEL, FISCHER & WITTFELD (1991) combined quantitative and qualitative methods (N = 102) and focused on biographical interviews. The authors stated that the

autonomous recovery always depends on the function of the drug in the own respective biography. Together with the study of WEBER & SCHNEIDER (1992), this study represents one of the first attempts in Germany to study in depth the phenomenon of self-recovery.

In his publication KLINGEMANN (1992) reviewed the available literature on spontaneous remission and also presented his own data collected in 1988, on Swiss subjects regarding spontaneous remission from alcohol and heroin dependence. As a result of rigorous screening, 60 remitters who were practically treatment-free were identified by the author. The analysis of the collected life histories led to the identification of a motivation phase, a stage of decision implementation, and a struggle for maintenance as the major sequence of the auto-remission process. The discussion by Klingemann focused on the tools which remitters use to put their decision into practice. The coping mechanisms identified by Klingemann were *diversion*, *self-monitoring*, and *distancing*. The paper of Klingemann focused on the first stage and the role of negative vs. positive experiences in setting off subsequent changes in alcohol or heroin consumption. The author illustrated the variation in the motivational background by taking a close look at the rich life history accounts as well as at quantitative data on life events and cognitive prerequisites of change.

A study by the author of this article evaluated long-term outcomes of alcohol dependence with and without professional assistance using a combination of different methods (GIACOMUZZI, MITTERMAIR et al. 2005). Long-term was defined as alcohol abstinence for a minimum of two years. The study had the objective to evaluate new research methods with semi-quantitative means. Therefore, the Basel Drug and Alcohol Questionnaire (BDA), the Symptom Check List (SCL-90-R), the sense of coherence scale (SOC-13) and the Repertory Grid Technique were applied.

The period of abstinence in the autoremitter group was 9.4 ± 5.3 and in the therapy group 10.6 ± 8.4 years ($p = 0.982$). Regarding the global characteristic values of the SCL-90-R, no significant differences between the two groups could be determined. The Basel Drug and Alcohol Questionnaire showed that the autoremitter group scored 3.7 ± 3.0 points and within the therapy group 5.5 ± 4.1 (scores under 19.5 points are considered to be inconspicuous). Autoremitters and therapy group scored nearly the same points in the sense of coherence scale (SOC-13). Autoremitters reached a score of 67.6 ± 11.3 and therapy-patients 68.3 ± 10.7 ($p = 0.867$). Regarding the salience (importance) within the repertory grid, no significant differences between the two groups were determined. However, a preference of the elements could be determined during the time of dependence.

However, the above-mentioned study showed no significant differences between the two groups in terms of global characteristics (SCL-90-R), degree of dependence on alcohol (Basel Drug and Alcohol Questionnaire), positive health outcomes and successful coping (SOC-13) and the capacity to apply alternative constructions (Repertory Grid). Coping mechanisms, psychological and physical conditions between the two groups could not therefore easily be distinguished. Further studies should focus on finding differences between autoremitters and therapy groups which might be relevant for addiction treatment.

7. Conclusions:

While there are many working definitions of addiction, the essence of the construct is still not clear. Consequently, addiction remains an imprecise concept. Recognizing the semantic problems, it is suggested that, while seeking a strict operational definition, we should also keep in mind that the comparison of different study results with different methodological methods is bound to be problematic.

A better understanding and combining of methodological approaches would certainly fuel advances in prevention and treatment. Unfortunately, the environment has also been shifting and the opportunities and social forces leading to addiction have created new problems. In fact, some of the main advances in control of addiction have emerged without recourse to sophisticated theories.

Looking into the future, it seems likely that major advances in the biological sciences, and in particular the mapping of the human genome, will also offer new insights and new opportunities for our understanding regarding the treatment of addiction and harm reduction. It is underlined that there is also a strong need for further research in clinical psychology which should lead to a better understanding and a more fine-tuned addiction treatment.

To be successful, an addiction or dependence model must blend the multidimensional aspects associated with it. It should account for regional and cultural variations, interpersonal preferences as well as hold true for the variety of addictions. In addition, a good model will describe a cycle that exists, that encourages increasing use until the addiction is overwhelming and leaves the host lame. Lastly, theories must be able to describe addiction as it occurs in human beings. Although animal studies can aid in understanding behaviour, results need to be carefully interpreted before they are applied to the much more complex human situation. In large part, the utility of these theories lies in their ability to generate novel hypotheses which in turn lead to useful predictions. Thus, a successful theory should enable prediction of circumstances in which the addiction phenomenon is more likely to occur and give insights into how it can be prevented, controlled or treated.

It might seek to predict whether a new drug will be addictive, who among a group of children will be at risk of developing addiction if exposed to particular stimuli, or whether changes in social factors will lead to an increase in the prevalence of particular forms of dependence. It should provide guidance on improved forms of treatment. Moreover, it should do these things better than a simple common sense view.

Several etiological models fail to properly address the vast multitude of causes that lead to maladaptive behaviour pattern specifically, because they strictly focus either on the individual (agent) or on the structural levels of analysis. An alternative exists in the form of cybernetic models. These models propose a feedback system that can better account for the various interactions between the agent and structural levels in leading to the establishment and maintenance of problem behaviour. In this model, the basic units of a human system are the agent and the structure. These two components should provide feedback to each other and influence each other's activities. Within the agent component, both biological and psychological factors have an impact.

When researchers study drug use in isolated *primitive* communities, they consider drug use from the point of view of its functioning as a mechanism of social integration; when they study drug use in ethno-cultural subgroups in contact with mainstream society, they consider drug use as a marker, or sometimes as a cause of social disorganization. It is suggested that researchers need to be aware of possible implicit assumptions about the relation between ethnicity and addiction.

There is still an ongoing discussion in the literature about the issue of whether there is a greater prevalence of drug use, drug-use-associated problems, or drug-use-enhancing attitudes in minority ethno-cultural subgroups when compared to mainstream society or not.

In the 1960s Winick reported that a large number of narcotic addicts known to the Federal Bureau of Narcotics apparently ceased narcotic use while in their 30s. He speculated that they *matured out* of addiction. During the 43 years since Winick proposed the hypothesis, several studies of chronic abusers have contributed to information on this issue.

Many of the studies on this subject suggest natural recovery but do not by any means settle the issue with detailed and conclusive data. A few studies explored the length of abstinence. In my study, for example, a two-year abstinence was taken as a criterion for natural recovery. It is possible that a sizeable number of persons in the other studies were experiencing some short-term or periodic abstinence from substance use and might be merely in temporary remission. Considering the length of abstinence is therefore crucial.

Important problems with the study of natural recovery are the processes related to the recovery and the characteristics of those who do overcome their addiction or dependence. It would appear that a significant numbers of addicts naturally recover from their addiction without treatment intervention. Some of the evidence even suggests that the untreated addict may have as good or possibly even a better chance at breaking the bond of addiction than the treated user.

Regarding the virtual absence of substantive information concerning the dynamics and processes – social, psychological and environmental – that may be at work to bring about recovery, semi-quantitative psychological methods were also employed in my study. This enabled the determination of the characteristics and resources of persons who recovered naturally and the comparison with their treated counterparts.

However, several factors make it difficult to assess the importance of maturing out in the process of becoming abstinent. First, some maturing out probably occurs while the person is dependent. Second, the influence of maturing may vary with the severity and duration of the substance dependence. Third, Winick and other authors seem at times to equate maturing out of addiction with prolonged abstinence. If we conceive of chronic drug abuse as an immature coping device, then any enduring abstinence can be called *maturing out*.

It would appear that *maturing out* is insufficient as a general explanation for all prolonged abstinence. While the concept has had considerable value in stimulating thought and research, it is still vague and needs further clarification.

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Artikel/Article: [Some remarks and terminological considerations on the addiction concept 183-200](#)