

The methodology of biopsychology: substance abuse



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To understand addictive behavior, one must understand the brain; the pursuit of this understanding is a challenge with great rewards. Analyzing human behavior requires subjectivity, while the brain contains objective realities; this requires holistic approach for full comprehension. Three general types of methodological issues are prominent in research involving assessment of addiction: (1) the reliability and validity of self-report, collateral, and biological methods of assessing substance use, (2) the variability and episodic course of substance use disorders, and (3) the heterogeneity of individuals with substance use disorders. The history, explanation, pathways and methodologies of addiction are all complex and need to be studied in the scope of biopsychology in order to advance the understanding and treatment of all addictions.

History

Chemical dependency has been part of every society and each millennium has treated the problems that addiction brings with a methodology unique to the times. Historically, society has attempted to deal with addiction in a certain way (Scheier, 2009). Based in fear of all the unknowns associated with substance abuse, the legal system sent addicts to prison, society in general shunned them and treated them as misfits, and the mental health community confined them to mental health institutions. Today the current modality of treatment for those afflicted with substance abuse is to attempt some way to get them help in whatever area they need it. Basic research on substance abuse has been a public science since the 1930s, funded almost entirely by the U. S. federal government (Scheier).

The popular experimentation with drugs in the mid-to-late 1960s raised many questions for which the traditional focus of Addiction Research Center had no answers (Smith, 2010). As a consequence, the field began to diversify and decentralize such that researchers had more

pathways from which to choose. Research pathways emerged in behavioral and neuro- or psychopharmacology (Scheier, 2009). Meanwhile, substance abuse also took to the street, bringing researchers into the community. This brought about the emergence of four significant research areas: qualitative social research, epidemiology, treatment research, and research based on self-reports (Scheier).

Definition of Addiction

There are several definitions of addiction. All addictions have common denominators of being a complex illness characterized by intense, uncontrollable craving, along with compulsive behavior even in light of devastating consequences. (Pinel, 2009). These commonalities also include: symptoms of withdrawal, tolerance, a desire to cut down or stop use/behavior, the inability to stop or decrease usage, loss of employment, estranged families, and social contacts are lost due to the addiction.

Addiction has many dimensions that disrupt several if not every aspect of an individual's life. In order to understand what addiction is a definition needs to be cleanly stated. Current neuroscientific research on substance abuse seeks to identify the cellular and molecular mechanisms that mediate the transition from occasional, controlled drug use to the loss of behavioral control over drug seeking and drug-taking that defines chronic addiction (Edwards, 2005).

Treatment Modalities

Every individual is unique and each person can respond differently to treatment modalities. Professionals that work in the field of addiction and treatment should be trained in current trends in alternative treatments and especially those that have proven effective. In the study by Castel, Rush, Urbanoski and Toneatto, (2006) their results show how complex addictions are and the overlap with mental health issues or other biological disorders. This study was strong in their methodology, but the use of a screening tool might have increased the rate of reported symptoms. Their study did not indicate this to be of significance. Their study has opened the pathway for future research in biopsychology that will illuminate some pivotal points in the biological nature of cross addictions with psychiatric issues and substance abuse indicators.

Medication and behavioral therapy, especially when combined, are important elements of an overall therapeutic process that often begins with detoxification, followed by treatment and relapse prevention. Easing withdrawal symptoms can be important in the initiation of treatment; preventing relapse is necessary for maintaining its effects (Fitzgerald & McCarty, 2009). Sometimes, as with other chronic conditions, episodes of relapse may require a return to prior treatment components. A continuum of care that includes a holistic treatment program that addresses all aspects of an individual's life, including medical and mental health services and follow-up options can be crucial to a person's success in achieving and maintaining a drug-free lifestyle (Scheier, 2009).

Methodologies for Study

Research in this field has produced a host of differing theories and models to describe the factors influencing drug use. The enormous amount of literature is impressive, yet overwhelming and often contradictory (Edwards & Cobb, 2010). The focus of this bibliography has been to assess the current state of substance abuse with respect to the focus of current research attention, and to identify knowledge gaps. Despite the limitations of the existing material, this view provides a useful platform to deepen and broaden the scope of biopsychological research.

This section will describe the studies in general and then will provide synopsis of the common theories that are present throughout each study as well as how each study stands alone. Each individual study will be described and the conclusions presented, this will be brief and to the point. There will be a more detailed discussion that will take into consideration all of the studies presented. The discussion will include the strengths and limitations of current methodologies, biology, similarities and differences with regard to the general theory of addiction and how the addiction pathways are formed as well as possible treatments. Finally, this section will address what needs to be considered in the future and what the studies brought up that needs to be examined in order to better understand and offer some solutions for future studies as well as to offer the reader options for future study and research.

The history, explanation, pathways and methodologies of addiction are all complex and need to be studied in the scope of biopsychology in order to

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advance the understanding and treatment of all addictions. Addiction has been a part of every society, socio-economic class, race, and gender and discriminates against none. There are a variety of theories of addiction as well as treatments; some founded in theory and others founded self-reports. The ability to treat and understand addiction rests in the hands of competent clinicians willing to examine possibilities that are not commonly thought of to be related to addiction. Understanding the biopsychology of addiction will aid in eliminating addiction for future generations to come.

Annotated Bibliography

Castel, S., Rush, B., Urbanoski, K., & Toneatto, T. (2006). Overlap of clusters of psychiatric symptoms

among clients of a comprehensive addiction treatment service. *Psychology of Addictive Behaviors*, 20(1), 28-35. doi: 10. 1037/0893-164X. 20. 1. 28.

This article describes the prevalence and overlap of psychiatric symptoms among 2, 784 clients

of the outpatient programs at a comprehensive addictions treatment facility.

The psychiatric

symptoms were assessed by a computer-based questionnaire, and the analysis focused on the

overlap of symptom clusters (multimorbidity) and their relation to selected intake variables

known to be predictors of treatment outcome. This study will help emphasize the need for a

detailed customized treatment approach.

Fitzgerald, J., & McCarty, D. (2009). Understanding attitudes toward use of medication in substance abuse treatment: A multilevel approach.

Psychological Services, 6(1), 74-84. doi: 10. 1037/a0013420

This study used a treatment unit survey for individual and organizational variables that

influence attitudes toward use of naltrexone, methadone, and buprenorphine for the treatment of

alcohol and drug disorders. Previous research has not considered both sets of influences

simultaneously. Hierarchical linear modeling tested the contribution of individual and

organizational variables with data from the National Drug Abuse Treatment Clinical Trials

Network treatment unit and workforce surveys (n = 2, 269 staff nested within 247 treatment

units). Individual-level variables consistently had more influence on attitudes, but a unique

blend of variables existed for each medication. One predictor, support for psychiatric

medications, influenced attitudes across all medications. Staff attitudes toward addiction

medications varied significantly between treatment units. This study can be a strong research

variable to establish the need for psychobiology to be an active participant for addiction

treatment. The appropriate use of addiction medications was evidenced by their results.

Ducci, F., & Goldman, D. (2008). Genetic approaches to addiction: Genes and alcohol. *Addiction*, 103(9), 1414-1428. doi: 10. 1111/j. 1360-0443. 2008. 02203. x.

This study examines the genetic basis for addiction, alcoholism in particular.

The study is a

literature review that focused on the genetic basis of alcoholism. The results of the review

show that alcoholic genes are acting at the pharmacokinetic or pharmacodynamic levels. There

has been major progress in gene identification in recent years, using intermediate phenotypes

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such as task-related brain activation, whole genome association studies, gene environment

studies, gene effects studies and the genome wide analysis. This study finds that the genetic

basis for alcoholism and other addictions is unknown, as further studies are conducted; they are

likely to find a link. This study will be used to demonstrate that addiction can be tied to genes

and that biopsychology will play an important part in the future of addiction.

Edwards, G. (2005). Addiction Biology goes fast forward. *Addiction*, 100(1), doi: 10. 1111/j. 1360-0443. 2005. 01109. x.

This article examines the new leadership established at the Society for the Study of Addiction.

Included are a variety of new appointments, as well as newly created ones.

This article

will be used to demonstrate the preparing of the addiction community to prepare for studied in

biopsychology and their acceptance and increased understanding of the matter. This article will

further show that addiction study is needed and that infrastructure is being created in order to

provide for this new understanding of addiction.

Edwards, S. & Koob G. (2010). Neurobiology of deregulated motivational systems in drug addiction *Future Neurology*, 5(3), 393-410. doi: 2034674321.

This study examines Neurobiological mechanisms for negative reinforcement, which mean that

participating in an addiction, in this study drug addiction, and it alleviates a negative emotional

state, and this involves changes in the brain and leads to forebrain stress.

This stress may

contribute to changes in the reinforcement mechanisms in the brain that are associated with

addiction. The points of the intersection between the positive and negative motivational areas

in the brain may drive addiction and may provide an increased understanding of the

neurobiological substrate for therapeutic intervention. This article will be used to further

examine that addiction is related to biopsychology and that determining the reinforcement

centers in the brain will aid in understanding the behavior associated with addiction.

Fitzgerald, J., & McCarty, D. (2009). Understanding attitudes toward use of medication in substance abuse treatment: A multilevel approach.

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variable to establish the need for psychobiology to be an active participant for addiction

treatment. The appropriate use of addiction medications was evidenced by their results.

Fortuna, J. (2010). Sweet preference, sugar addiction and the familial history of alcohol dependence: Shared neural pathways and genes. *Journal of Psychoactive Drugs*, 42(2), 147-51.

This study examines the fact that many people who are addicted to drugs and alcohol also have

a sweet preference, particularly those with a high sucrose concentration.

This study further

examines that some people who have a high consumption of sugar rich foods and drinks

demonstrates the release of euphoric endorphins and dopamine in the same way that alcohol

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and drugs do. This study asserts that the neurobiological pathways are the same for sugar and

drug addiction. Craving, tolerance, withdrawal and sensitization have been documented in both human and animal studies. This study goes on to show that there is a cross sensitization

between sugar addiction and narcotic dependence. This study also demonstrates that the

biological children of alcoholic parents, particularly fathers, have a strong sweet preference and that may show up in eating disorders in later life. This study will be used to demonstrate that addiction can be determined through genes and can manifest in different addiction choices.

Gillman, A., Kosobud, A., & Timberlake, W. (2010). Effects of multiple daily nicotine administrations on pre- and post-nicotine circadian activity episodes in rats. *Behavioral Neuroscience*, 124(4), 520-531. doi: 10.1037/a0020272.

This study has shown that nicotine that is administered with an entertaining activity and that it

affected food intake and that throughout the pre and post dose that there was a relation to the

increase in the desire for the activity and as well as the nicotine. This study will be used to

demonstrate that cross addiction and transference can happen in addiction resulting in the way

the brain synthesizes entertainment and addiction. It will be used to demonstrate that there are

addiction areas in the brain and that stimulation of one can increase other areas.

Haber, J. R., Bucholz, K. K., Jacob, T., Grant, J. D., Scherrer, J. F., Sartor, C. E., Duncan, A. R. & Heath, A. (2010, September). Effect of paternal alcohol and drug dependence on offspring conducts disorder: Gene-Environment interplay. *Journal of Studies on Alcohol and Drugs* 71 (5); 652-663. ISSN: 1937-1888

This article discussed current research on substance-use disorders and externalizing disorders

that frequently present simultaneously, as well as in families across generations. Researchers

examined the role of genetic and environmental influences in the relationship between paternal

histories of drug dependence or alcohol dependence and offspring conduct disorder using an offspring-of-twins design. The methodology used male twins from the Vietnam Era Twin

Registry, their offspring, and mothers of the offspring. The study was difficult to follow, but

yielded results that indicated genetic risk associated with both paternal drug-dependence and

paternal alcohol-dependence histories predicted offspring conduct-disorder risk, but only risk

associated with paternal drug-dependence history was mitigated by having a low-risk

environment. This study will be used to demonstrate a significant gene-environment

interaction, indicating a strong need for further biopsychological research in this area.

Lee, P., Lee, D., & Lee, P.. (2010). 2010: U. S. Drug and Alcohol Policy, Looking Back and Moving

Forward. *Journal of Psychoactive Drugs*, 42(2), 99-114.

This article demonstrates the different perspectives in the usage of the disease model of

addiction indicating the influence of The United States drug policy. This article spans

various areas of substance abuse research with the focus on new perspectives for future research and changes to the drug policy of the United States. This article will be used to show where the future of biopsychology and substance abuse research is headed.

Pinel, J. P. J. (2009). *Biopsychology* (7th ed.). Boston, MA: Pearson Education, Inc.

ISBN: 978-0-205-54892-7.

This book covers a variety of biopsychology topics in depth as well as anatomy of the brain.

This book will be used as a reference to explain the tests used for the determination of behavior

and brain connectivity. It will be used to describe the parts of the brain that are related to

addiction. It will also be used to explain how addiction works in the brain.

Scheier, L. M. (ed) (2009). *Multiple paths to partial truths: A history of drug etiology*. The Handbook

of Drug Etiology: Theory, Methods, and Empirical Findings. American Psychological

Association. Washington, DC. ISBN: 978-1-4338-0446-5

This handbook covers the complexities of personality, genetic, environmental, and cultural influences on behavior that are difficult to dissect or treat as independent forces. This volume covers this dynamic field comprehensively. A team of researchers presents dissimilar theoretical perspectives and viewpoints on complex issues ranging from causation to consequences and including a rich discussion of prevention practices and how they influence policy. The editor and contributors show the origins of the field of drug use etiology in clinical work with addicts, detail the history of the field and examine the interaction of epidemiology and etiology.

This book will be used to examine substance abuse causations such as peer pressure, community, genetics, race, and age. This will help determine the ways in which drug use etiology links with biopsychology.

Smith, D. (2010). The evolution of addiction medicine and its San Francisco roots. *Journal of Psychoactive Drugs*, 42(2), 199-201.

This article examines how addiction has evolved from its roots in San Francisco. It examines a

variety of problems that are caused from drug addiction and the problems that it causes to

society. This article will be used as a historical reference and as a general reference to the

history of drugs in general. Addiction research has attempted to keep up with the rapid

progression.

Sofuoglu, M., Sugarman, D., & Carroll, K. (2010). Cognitive function as an emerging treatment target

for marijuana addiction. *Experimental and Clinical Psychopharmacology*, 18(2), 109-119.

doi: 10. 1037/a0019295.

Cannabis is the most widely used illicit substance in the world, and demand for effective treatment is increasing. However, abstinence rates following behavioral therapies have been modest, and there are no effective pharmacotherapies for the treatment of cannabis addiction. We propose a novel research agenda and a potential treatment strategy, based on observations that both acute and chronic exposure to cannabis are associated with dose-related cognitive impairments, most consistently in attention, working memory, verbal learning, and memory functions. These impairments are not completely reversible upon cessation of marijuana use, and moreover may interfere with the treatment of marijuana addiction. Therefore, targeting cognitive impairment associated with chronic marijuana use may be a promising novel strategy for the treatment of marijuana addiction. Preclinical studies suggest that medications enhancing the cholinergic transmission may attenuate cannabis-induced cognitive impairments, but these cognitive enhancing medications have not been examined in controlled human studies. Preliminary evidence from individuals addicted to other drugs suggests that computerized cognitive rehabilitation may also have utility to improve cognitive function in marijuana users. <https://assignbuster.com/the-methodology-of-biopsychology-substance-abuse/>

Future clinical studies optimally designed to measure cognitive function as well as drug use behavior would be needed to test the efficacy of these treatments for marijuana addiction.