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A Unified Theory of Addiction

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Abstract

It is possible to imagine a universal cause for addictive behavior across many conditions and compulsions including addiction to alcohol, addiction to drugs, compulsive gambling, porn addiction, sex addiction, eating/food addiction, thrill-seeking, shopping addiction, trichotillomania, and other compulsive behaviors. This paper presents evidence that the universal source of addiction is the displacement mechanism, and that treatments that quiet this displacement should work with every addiction and compulsive behavior.

Displacement behavior represents a bio-behavioral mechanism that essentially allows an animal to displace stress. Theoretically, the mechanism rechannels overflow mental energy built up by the brain's attempt either to deal with or to avoid the stressful situation. The energy rechanneling occurs to another behavior or drive (e.g., grooming drive), typically whatever drive or behavior is the most readily available.

Normally, the displacement mechanism is adaptive. However, in certain instances it may become harmful, particularly if the displacement occurs repetitively. For example, dogs and cats lick their fur for cleaning but also as displacement of stress. Repetitive licking may denude the hair and damage the underlying skin. Moreover, the brain may not select a healthy displacement behavior, e.g., a person getting intoxicated when stressed.

An intervention based on the displacement mechanism and adaptable for any addiction has been developed, consisting of (1) helping the individual identify the problem (s) or stressor (s) that form the basis of the overflow mental energy, and (2) creating strategies to either avoid or effectively resolve these problems/stressors. For in-the-moment urges, the individual may purposely rechannel overflow brain energy to a non-harmful drive, e.g., deep breathing, to mitigate the urge, while the displacement source (s) is identified and dealt with.

A clinical trial with this app treating eating addiction is in progress.

Keywords: addiction, addictive, compulsive, displacement, behavior, activity.

Introduction

Might it be plausible to consolidate the causes of different addictions and explain all addictions with a single theory? Albert Einstein's quest for a unified field theory may be a comparison. Perhaps, a universal treatment for addiction would then be feasible. The *displacement mechanism* might inform such a unified theory of addiction.

Displacement

Displacement behavior represents a bio-behavioral mechanism ^{[1][2]} in the brain of all animals that allows the organism to deal with situations that cannot be readily faced, yet cannot be avoided (i.e., "stress"), or that are thwarting. It may explain addictive behavior. Resembling addiction, displacement behavior is irrepressible and contextually inappropriate, e.g., sleeping or preening when threatened by a predator, or binge eating in response to a work altercation. It is thought to be due to rechanneling of overflow brain energy to another drive (e.g., grooming drive, feeding drive) when two drives, e.g., fight or flight, equally oppose each other. The fight-or-flight response is a cornerstone of stress research ^[3]. Nervous energy builds up in the brain either to deal with or avoid stressful situations, and this excess mental energy is "displaced" to the addictive behavior. Hypothetically, the displacement mechanism is a normal mechanism that may go rogue.

Moving the opposing drives out of equilibrium, by resolving or avoiding the underlying problem/stressful situations, should theoretically mitigate the displacement mechanism and the addictive behavior. For example, stress due to medical problems can be displaced by self-destructive binge drinking, or can be displaced by self-enhancing medical journaling ^[4].

From sensation to compulsion

Initially, a pleasurable sensory cue (or "high") suggests to the brain that the drive associated with that cue might be used to rechannel (displace) overflow mental energy produced by the stressful life situation (s) that the person cannot face yet cannot avoid. An article in the *Journal of Personality and Social Psychology* refers to this displacement as "catharsis" ^[5]. The brain seems then to lock onto the respective drive and subsequently the same sensory cue triggers the displacement of overflow mental energy to that drive. That is why addiction is described as "getting hooked," because the cue response quickly becomes a dependency ^[6].

Smoking as displacement

With smoking, the brain uses the breathing or "sigh" drive to displace the overflow mental energy. It is well known that taking slow deep breaths in, and then out, is calming. Nicotine is the cue that suggests to the brain that slowly and deeply inhaling and exhaling cigarette smoke will displace overflow mental energy ^[7]. Nicotine lozenges do not have the same cue effect. Vaping works as well as smoking, with the slow inhale and exhale stimulated by the nicotine cue, whereas nicotine inhalers do not. It is not the diaphragm or chest muscle movement that displaces the overflow brain energy; it is the brain's intense focus on slowly and deeply inhaling, hesitating for a moment, then exhaling, which displaces the overflow mental energy. One study was able to confirm that smoking relieves stress ^[8]. Another study of cigarette

smoking in a population identified as having “obsessive/compulsive syndrome” (OCS) found that “smokers with elevated OCS capitalize on smoking to assuage OCS.” [9]. Hypothetically, OCS may be caused by a congenital overactive displacement mechanism.

Hand motion displacement also occurs with smoking. A woman in our hospital was not allowed to smoke and was quite distressed. She was so relieved when the volunteers brought around little candies that she had to unwrap to eat. She exclaimed, “It gave me something to do with my hands.”

With nail biting, skin picking, and trichotillomania, the displacement would seem to resolve to the grooming drive, as does acral lick disorder in socially isolated dogs [10], where the dog may lick the paws raw.

Chemical dependence vs. behavioral addictions

Becoming intoxicated with alcohol, or with a drug, is a displacement behavior. Chemical dependence is a side issue, amenable to detox/withdrawal that is facilitated with medication. The most addictive substances do not have the most severe chemical withdrawal symptoms. If displacement theory is accurate and provides a unified theory of addiction, the distinction between substance and behavioral addictions may be moot.

Addictions are not permanent

In heroin addiction, the classic displacement source is what happened to the U.S. soldiers in the Vietnam war, where one in five soldiers was strung out on heroin. It was greatly feared that when returning to the U.S., these 500,000 soldiers who were addicted to heroin would yield a huge epidemic of heroin addiction. However, of these addicted soldiers that returned from Vietnam during and after the war, 90% never used heroin again, which turned the addiction field upside down [11].

Addictive substance or addictive situation

It seems that in Vietnam the soldiers could not face the war, yet they could not avoid it. Their brain displaced the untenable war situation with the heroin addiction. Once the soldiers were released from service, they avoided the war thereafter, so their brains no longer needed to displace the situation with the heroin addiction. This example would seem to conclusively show that it is not the properties of the addictive substance that cause the addiction; it is rather a combination of life situation and displacement activity that is responsible for the addiction.

From thrill to compulsion

Gambling addiction appears to start when a “win” suggests to the person’s brain that gambling behavior could be used to

displace overflow mental energy produced by a life situation the person cannot face yet cannot avoid (i.e., stress again) [12]. “Chasing losses” is conventionally claimed to keep gambling going. Yet, it is not the desire to recoup the losses that seems to perpetuate the gambling. Rather, it is the fact that losses are stressful, and that the default way through which the person’s brain has learned to handle stress is by gambling, a classic vicious circle. Plus, the person’s life falls into disarray due to gambling, which is stressful, and again the default way to deal with stress has become gambling, another vicious circle. To break these vicious circles, the person must deal with the underlying problematic situations in their life.

Drives and displacement

The term “drive” needs an elucidation regarding the displacement mechanism. Displacement seems to occur only to hard-wired behaviors or drives, not to learned behaviors. The brain would seem to use any hardwired behavior to displace overflow mental energy. For example, at age 14, I was sent to boarding school, where we had to wear coats and ties for the majority of the time, with tight collars. By frequently wrenching my neck because of the tight collar, I developed a nervous tic in the muscle of my neck. The wrenching of my neck evidently suggested to my brain that the muscle movement could be used to displace overflow mental energy. The harsh conditions of the boarding school certainly produced substantial overflow mental energy in my brain – I dreaded the school, yet I could not escape from it (my parents said, “It will build character.”). Many years later, I still experience the tic in my neck muscle when I am under significant stress.

Immune system effect

The displacement mechanism may in fact impact the immune system. For example, the stress caused by a cancer diagnosis makes tumors worse, according to the National Comprehensive Cancer Network distress thermometer (NCCN-DT), a tool used to identify stress in cancer patients and recommend interventions [13]. Functional bowel disorder (e.g., irritable bowel syndrome) is mediated by the nerves connecting the brain to the gut [14], and overflow mental energy from stress may be displaced to the gut causing this disorder. Inflammatory bowel disease (e.g., Crohn’s disease), likewise, may possibly be caused by displacement to the gut.

Rechanneling the displacement

Theoretically, the displacement mechanism functions by rechanneling overflow mental energy to another drive or behavior, typically whatever behavior is most readily available at the time or is most commonly used in the animal’s repertoire, e.g., grooming and feeding [2]. If the rechanneled behavior becomes destructive, it is possible for the individual to willfully rechannel the overflow mental energy to a nondestructive behavior. Examples are rechanneling to breathing behavior (by taking slow, deep breaths), rechanneling to squeezing the hands, and rechanneling to hobbies [15].

The displacement equation

The displacement mechanism might be expressed as an equation per Table 1, using the examples of skin picking and gambling behaviors. Again, it is not muscle energy that is thought to be expended by the displacement mechanism, but rather brain energy or mental energy [16]. Displacement behavior involves intense focus on the respective medium and the cues (e.g., rough skin, slot machines). The intense focus, ostensibly, is how overflow mental energy is expended [17]. Rechanneling diverts the focus to a nondestructive medium (e.g., squeezed fists). Dealing with the displacement sources diminishes the focus on the destructive medium and brings about desensitization to the cues. Variables of the displacement equation might be quantified by validated questionnaires.

Displacement = Source + Cue + Medium - Rechanneling

$$D = S + C + M - R$$

Table 1. Formulaic expression of the displacement mechanism

Variable	Name	Explanation
D	Displacement	Displacement severity (e.g., degree of skin picking, excessiveness of gambling)
S	Source	Source of the displacement (e.g., stressful life situations, thwarting): level, quantity, acute vs. chronic
C	Cue	Cue triggering the displacement: (e.g., cuticle raggedness, slot machine noise): cue sensitivity, cue availability, cue quality
M	Medium	Displacement medium (e.g., ragged cuticles, casinos): quantity, quality, availability
R	Rechanneling	Rechanneling the displacement (e.g., deep breathing, squeezing fists, hobbies): quantity, quality, availability

A new therapy for displacement and addiction

An intervention based on the displacement mechanism and adaptable for any addiction has been developed, consisting of (1) helping the individual identify the problems or stressors that form the basis of the opposing drives (displacement sources), and (2) creating strategies to either avoid or effectively resolve these problems/stressors. Success does not depend on totally resolving or avoiding the person's problematic situation, it is just necessary that the opposing drives are pushed off dead center (either face or escape) and no longer in equilibrium. 3) As an intervention, stress that would have otherwise led to self-harming behavior can be rechanneled into benign displacement activities, e.g., hobbies. For in-the-moment urges, overflow brain energy may be rechanneled to a non-harmful drive, e.g., deep breathing, to mitigate the urge, while the displacement source is identified and dealt with. Avoidance of cues, e.g., slot machines, is paramount. Again, desensitization to cues occurs when displacement sources (life situations) are dealt with. Anecdotally, a 20-year-old overweight female was no longer tempted to turn into the McDonald's drive-through once she created plans for her difficult life situations before driving home from work. Abstinence/withdrawal from the cue medium enhances desensitization.

Clinical trials underway

This intervention has been implemented as a smartphone app, adaptable for any addiction. The only parameters that need to be changed for each addiction type are the medium and the cues. A clinical trial at UCLA on eating addiction [18], involving 46 participants, 8 in each of two beta tests and 30 in the main trial, is in progress. Trials on other addictions will soon follow.

Discussion

In a study on the co-occurrence of addictions in a typical US adult population, more than half (50.8%) of 6,000 respondents reported experiencing a problem with one or more of the examined substances and behaviors during the 12 months preceding the study. Twenty-one percent reported problems with two or more substances or behaviors, and greater than half of those reported three or more problematic behaviors [19].

A universal treatment for addiction as described in the current paper would have a significant advantage in that such co-occurring addictive disorders could be treated concurrently. In the UCLA eating addiction trial in progress, one participant, a 19-year-old male, happened to be affected not only by eating addiction but also by alcohol addiction. The app had been adapted for alcohol addiction. Thus, in addition to decreasing his problem food consumption, the participant was able to decrease his vodka consumption from two bottles per week to a half bottle per week by detox/withdrawal and his plans to deal with the death of a close friend and arguments with his family, including talking to other people about his grief and avoiding his family.

Conclusions

The displacement mechanism may serve as the basis for a unified theory of addiction. A universal treatment for all addictions may be feasible. Perhaps the term “addiction” should be replaced with “dysfunctional displacement.”

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