

The Rationality of Addiction

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This paper presents a discussion on the rationality of addiction using economic theories. Drug abuse is the dominant context for addiction in this paper. However, it does not preclude a broader definition, encapsulating dependence on substances other than pharmacological agents; let it be nicotine, alcohol, coffee, chocolates or sex.

The argument follows the progression in rationale from consumption to addiction to eventual remission. The economics of any behaviour, addiction-motivated or otherwise, distils down to the scarcity of means and our intuitions of opportunity costs involved in making a choice. The two concepts are interrelated. The process of decision-making weighs the benefit of each choice (its marginal utility) against its opportunity cost.

In utility maximization theory, money is a scarce resource assumed important for maximizing utility. Therefore, choice on consumption is decided by the relative price between two goods. Overall utility is maximized when the ratio of the prices of two desired goods is equal to their marginal rate of substitution – the ratio of their marginal utilities. That is, the objective or source of utility for a consumer is to maximize the total value of their available money.

However, economics is a social science that encompasses more than financial concerns. Similarly, a posted market price is one of many possible opportunity costs that people may consider in their decision-making. The consideration of relevant opportunity costs is ever changing with the decisions to be made and varies in degrees from being impulsive and rash to systematic and deliberate. Individuals also vary in their preferences and the scarcity of their resources as well as the priority they place on various opportunity costs (e.g. money vs. time).

Therefore, the most relevant opportunity to maximizing total utility is not necessarily money, and two choices are not necessarily equally substitutable with each other. Some choices are naturally preferred in large or small dosages, such as oxygen and UV radiation respectively. Cultural and social norms can place emphasis on social image, commercial labels and appearance. Situational demands and personality predispose certain behaviours, such as altruism or hedonism.

We expand the utility maximization theory to introduce a hierarchy of opportunity costs, the ordering of which reflects the context and individuality of the decision-maker. A rational agent is expected to decide between two goods relative to the change in relevance or priority among all relevant opportunity costs. Hence, total utility is optimized when the ratio of marginal utilities equates the ratio of the most relevant opportunity costs between two choices.

When time is of greater scarcity than money, utility can be maximized through greater efficiency. An example may be a shift in the style of meal preparation from home cooking to purchasing readymade meals with higher market prices. This expansion on the scope of the utility maximization theory is the basis for our interpretation of rationality in drug addiction, in chronological progression from consumption to addiction and finally, remission in some.

Consumption

What good reason compels individuals to take drugs? Some psychologists have linked clinical drug dependence with self-reported poor quality of life (Laudet et al., 2009). Depression is among the many reasons to justify drug use (Conner et al., 2008).

Illicit substances provide direct and fast sensory alterations and that of brain chemistry. The temporary enhancement in sensory experience produces unnaturally high levels of pleasure. For others, temporary relief from otherwise unbearable emotional distress is

more important. In both categories of users, the utility perceived from drugs is disproportionately higher than any opportunity costs incurred.

Some people have great difficulty in being uninhibited and relaxing at will, due to socio-cultural and personality issues. Then there are those predisposed to thrill-seeking or rebellious behaviours and crave attention and recognition. For them, drug is secondary to the need for public attention and deviation from social norms. The rationale emphasises an underestimation of personal and societal opportunity costs.

Peer pressure can also have a perverse impact on teenagers and young adults. The combination of euphoria and acceptance can tempt individuals to succumb to the drug culture that may be permeating the social group. An important assumption here is that an individual can be rational yet unconscious to the effects of social influences.

Finally, some addictive drugs are used by medical professions to treat certain conditions. Opioids are widely used by chronic pain sufferers (Chou et al., 2009). Psychoactive drugs stimulate otherwise abnormally low brain dopamine levels (H. P. Rang et al., 2003). Psychosomatic medicine treats physical symptoms that originate from psychological causes (Andrews, 2001).

With the exception of medical reasons, there is no greater long-term gain from drug consumption, knowing the associated risks. However, technically rationality has no normative connotation. It is constantly subjected to external subliminal influences and so only has to make logical sense to the thinker. Drug users for example, make voluntary and rational choices based on the perceived relevance and affordability of their opportunity costs.

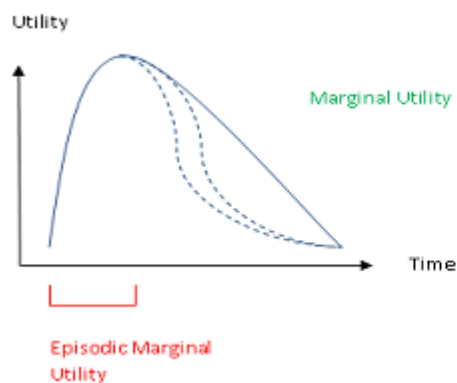
Addiction

Persistent drug consumption inevitably leads to addiction and abuse. We will divide addiction into its paradoxical elements of craving, tolerance and dependence, from which inferences can be made about the detrimental effects on drug addicts.

In simple terms, as the addict develops a tolerance for the drug, an increase in the consumption dosage of a substance is required in order to obtain the same level of utility, in terms of the levels of physiological responses. Tolerance therefore mimics the pattern of consumption for normal goods where, over time, the marginal utility diminishes. A logical solution would be to allow intermission between episodes of consumption.

However, three reasons ensnare addicts in a non-remitting vicious cycle of drug abuse. First, the episodic marginal utility increases immediately post consumption (see Fig. 1). Second, with a general preference for immediate payoffs, people tend to discount any payoffs (positive or indeed negative) that may accrue more distant in time. Third, the body's physiological dependence on the drug of choice must be satisfied to stave off unpleasant withdrawal effects.

Figure 1 marginal utility curve for continuous consumption over time.

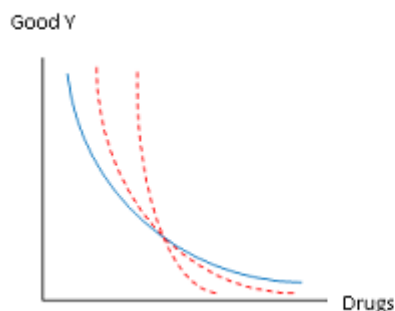


The bold marginal utility curve in Figure 1 depicts the initial surge in episodic marginal utility that reinforces consumption, which gradually decays over time. The figure also

illustrates that over the life time of drug abuse, the slope of diminishing marginal utility becomes increasingly steeper (i.e. the dotted slopes), which reflects the effects of tolerance.

The indifference curve also changes over the course of addiction. Holding income levels constant, the quantities of drugs demanded to reach total utility increases, forgoing greater quantities of the numeraire good (Y) (see Fig. 2). The discrete change in the slope of the indifference curve occurs at the point of inflexion on the marginal utility curve (Fig. 1), but the increase in asymmetry is triggered by an intensification of addiction, i.e. the effects of tolerance and withdrawal.

Figure 2 indifference curve for the ratio of substitution of numeraire good Y for drugs



Withdrawal

Abstinence leads to withdrawal, which warps a person's status quo - their state of mind and sense of well-being. In contrast with tolerance, withdrawal symptoms heighten the demand for drugs instead of the quantities demanded, thus shortening the period between consumption. Chronologically, this occurs on the utility curve before consumption takes place (Fig. 1), skewing the indifference curve rightward towards a narrower (the term is reserved for demand curves.) range of quantities demanded for drugs (Fig. 2). The greater

the desire to consume a good, the higher its post-consumption marginal utility will be to promote continual consumption.

Withdrawal is a necessary phase of recovery from drug addiction. However, addicts have a tendency to underestimate opportunity costs, feelings that they have very little to lose. Therefore, it becomes a salient opportunity cost when whatever grasp of normality they had is taken away by withdrawal effects. The simplest solution is to succumb to their cravings.

The sad reality is that perceptually, future episodes of consumption will never match the utility of that very first time. As we mentally re-experience events, our brain distorts and exaggerates our memory. Even if our physiological responses were identical, we will never feel as satisfied with the high, driving us towards increasing dosages. This is the psychological component of tolerance, whereby total utility for a constant dosage is reduced over time. Generally, in order to reset our expectations of a good, a period of abstinence (extinction) must be relative to the preceding period of consumption (which conditioned the expectation).

Remission

People take drugs as a means of temporary fulfilment. However, depression is not the primary driving factor for drug use, but rather small aspirations for greater utility that is typical of the beginning of recovery from depression (Conner et al., 2008). With the right help, they can further their recovery and gain a positive outlook and the willpower to seek better long-term solutions. Indeed, the decision to quit often follows the revelation that drugs cause them more harm than good.

Cognitive-behaviour therapy is most effective in re-educating people's perception and cognition. Sustained remission is highly correlated with higher life satisfaction; subjects reported they were "sick and tired of being sick and tired" (Laudet et al., 2009).

Rehabilitated individuals associate future drug use with higher opportunity costs; the model of utility maximization that conforms with the normal population.

Conclusion

A comprehensive understanding of addiction requires research into the multiple dimensions of positive health. Economic theories alone (and indeed any other discipline) do not fully inform the social and psychological realities a vulnerable drug user is likely to encounter.

Addicts are irrational by conventional economic, social and psychological standards. Nonetheless, we concur that they are rational agents striving for a more gratifying state of wellbeing or existence, at minimal opportunity costs.

However, in the course of rational albeit myopic self-serving, these agents place tremendous burdens on themselves and society. The ultimate goal is to effectively educate and realign people's cognition with appropriate treatment and prevent drug abuse altogether. Thorough research and unbiased understanding into addiction form the necessary foundation to the accomplishment of the ultimate goal.

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