

**CANNABIS AMOTIVATIONAL SYNDROME
AND PERSONALITY TRAIT ABSORPTION:
A REVIEW AND RECONCEPTUALIZATION**

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Nelson, P. L. (1994-95). Cannabis amotivational syndrome and personality trait absorption: A review and reconceptualization. *Imagination, Cognition and Personality*, 14(1), 43-58.

ABSTRACT

This paper argues that the so-called cannabis ‘amotivation syndrome’, widely reported in the literature, may not be a single nosological entity, but represent, instead, a change in cognitive style emerging as a result of cannabis’s ability to facilitate a unique attentional state favoured by those who have a higher than average level of a personality factor referred to as ‘trait absorption’. Exaggeration of the absorptive style of cognition through cannabis use, when taken in the context of either a pre-existing or a reactive depression, may be what has been mistakenly categorized as ‘amotivational syndrome’.

INTRODUCTION

In spite of the pressure of increasing law enforcement campaigns and more sophisticated educational endeavours in Australia and other Western democracies, cannabis is not apparently losing its attractiveness to many young people [1]. One of the major concerns expressed by those who are attempting to reduce cannabis use in the young is the occurrence amongst users of a collocation of behaviours and attitudes collectively referred to as the 'amotivational syndrome' [2, 3]. This presumed psychological syndrome is believed to be a direct result of regular, heavy cannabis use and leaves those so affected reduced in motivation and capacity for the usual activities required for achievement and success in today's world. Although many anti-cannabis campaigners accept, *a priori*, the existence of the 'amotivational syndrome', there is still some considerable debate as to whether it is an actual nosological entity and whether all cannabis users are so effected.

This article will argue that 'amotivational syndrome' is not, in fact, a single entity, but, rather, a collection of behaviours which emerge as the result of the combination of the effects of an already existent or a reactive depression occurring concomitantly with cannabis's ability to facilitate a unique attentional state favoured by those who have a higher than average level of a personality factor referred to as 'trait absorption' [4]. Thus, the apparent loss of motivation [for many socially accepted behaviours and tasks as well as the changes in attitude and cognitive style associated with cannabis use may represent a re-orientation in attentional style, meaning and values rather than merely a collapse into pharmacologically induced pathology. So, it may be that cannabis is not being predicably affected by educational or law enforcement programs because the urge to use the drug arises for many from a primary psychological need which far outweighs the power of those sorts of external pressures. The primary personality 'need' being described here is the propensity of certain individuals to seek and choose to experience 'flow' [5] or 'absorptive' states for their own sake because of their intrinsic self-rewarding qualities.

In order to explore the possible relationship between 'trait absorption' and apparent 'amotivational syndrome' this paper will first present a review of the 'amotivational syndrome' literature followed by a delineation of the personality factor, 'trait absorption'. In the final section a re-examination of 'amotivational syndrome' will be undertaken in the light of the discussion of the absorptive personality type and the unique styles of attention deployment preferred by these individuals. Further, it will be suggested that not only are attempts by cannabis users to augment the

'absorptive' cognitive style not pathological, but this type of behaviour may be seen as a healthy sign of a striving to re-balance cognitive 'style' from over-dependence on the active, achieving, doer mode of the post-industrial age to the 'receptive' style of the visionary and mystic more reminiscent of traditional spirituality and artistically creative life-styles [43].

AMOTIVATIONAL SYNDROME

Cannabis research has, for the past three decades, failed to reach any unassailable conclusions regarding long-term psychological effects of the drug on otherwise normal, healthy users [6, 7, 8, 9, 45, 46].¹ Research has been, at best, problematic, taking place in the midst of a highly emotionally charged debate. Pharmacologically, when cannabis is ingested the primary psycho-active ingredient, delta-9-tetrahydrocannabinol (THC), rapidly disappears from the blood plasma and is taken up in fat where it remains with a half life decay rate of 5-7 days. This means that following a single dose of THC, less than 1% of the primary active ingredient remains in fatty tissue after approximately 35-50 days [10]. THC's oil solubility, and thus its high affinity for fatty tissue, probably accounts for its attraction to neural tissue with its high lipid content. Although, in the case of light to moderate cannabis users THC can be detected in body fluids for approximately 30 days after the last consumption, it is quite difficult to detect perceptual-motor effects this long after a given average single dose (1-3 mg THC in cannabis to be smoked). This is unlike alcohol where a clear dose/response curve is demonstrable in which effects of ethanol on behaviour and judgement can be demonstrated at blood levels below 0.05% [11].²

These properties of long half-life and high intoxicant activity of THC have been a major confounding factor in previous clinical and closed ward behavioural and performance studies of the effects of cannabis in humans [9]. The high dose rates of the typical chronic cannabis user recruited for many of these studies, when taken in the context of the relatively long half-life of THC, suggest that behavioural and psychological tests conducted on chronic users, who are supposedly no longer using cannabis, are, in fact, being carried out on individuals still somewhat intoxicated [9, 12]. Hence, any ascriptions of permanent neurological, behavioural, cognitive or affective changes due to cannabis are

¹Here we must separate 'users' from 'abusers'. The DSM-III-R defines abusers as: Cannabis Dependence is usually characterized by daily, or almost daily, use of the substance. In Cannabis Abuse, the person uses the substance episodically, but shows evidence of maladaptive behavior, such as driving while impaired by Cannabis Intoxication [48, p. 176].

²In their comparative study Chesher *et al* have estimated that a dose of cannabis originally containing 1 to 2 mg THC produced a decrement in performance on a battery of psychological tests which was approximately the same as that produced by alcohol at a concentration of 0.05% (at peak) [11, p. 627].

often confounded. In addition, as will be argued later in this paper, cannabis appears to facilitate the learning of cognitive styles which emphasize capacities quite different from and contrary to those required for doing well on most psychological performance tests.

From the recent work of Herkenham *et al* [13] in mapping the distribution of cannabis binding sites in the brain there is no doubt that the cannabinoids have affinities for certain brain structures. However, it is as yet unclear as to whether cannabis has any predictable specific behavioural, cognitive, and/or affective consequences resulting from the particular receptor site bindings mapped in their study. To date it is not possible to describe a unique and repeatable constellation of psychological responses to the action of the cannabinoids as is possible for the opiate derivatives or the neuroleptic compounds used in the treatment of schizophrenia [9]. This observation alone must cast some considerable doubt on most psychopharmacological ascriptions made for the actions of the cannabinoids in the human central nervous system.

There is little doubt, however, that cannabis has some effect on the nervous system during acute intoxication. This can be seen from the wide variety of psychological changes reported by users and observed by researchers. Weller [14] summarizes a number of findings across a variety of studies which purport to delineate psychological profiles due to the effect of cannabis.

One study found that marijuana users were more impulsive and nonconforming than nonusers. Another study discovered more “psychiatric impairment” in users based on personality tests. A self-administered drug survey conducted at two colleges found that users were less likely to be at the top of their class, had looser religious ties, and were more dissatisfied with school. They were also more likely to be bored, anxious, cynical, disgusted, moody, impulsive, rebellious, or restless. In still another study, marijuana users were more opposed than nonusers to external control and likely to use the drug to relieve tension (p.101).

However, he criticises these characterisations by arguing that little effort has been made to determine the personality types and differences before subjects became involved in a cannabis ‘lifestyle’. Thus, it is arguable that any ascription of personality type or permanent behavioural effects of cannabis on users must be seen as somewhat spurious. This logical error of explaining the behaviour of cannabis users, *post hoc*, in the absence of within-subject controls, appears to be a commonly repeated one throughout the cannabis literature. On the other hand, Weil’s [15] argument that cannabis is an “active placebo” (p. 95), which facilitates already existent covert behaviours and pathologies, offers an

equally credible explanation for most observations made concerning pathological syndromes associated with cannabis use. In addition, Weil's view has the added benefit of accounting for, in part, the great variation seen from individual to individual when intoxicated with THC.

One such constellation of behaviours, which has been repeatedly claimed as a unique nosological entity peculiar to chronic cannabis users, has been labelled 'amotivational syndrome' [2, 3, 10, 16, 17, 18, 19, 20]. McGlothlin and West first reported that regular cannabis use can lead to the development of passive, inward-turning, amotivational personality characteristics. At about the same time, Smith made a similar observation, based on several young marijuana users, that regular cannabis ingestion leads to a loss of desire to compete and work which, like McGlothlin and West, he labelled 'amotivational syndrome'.

Weller [14] describes the origins and general characteristics associated with this hypothesized syndrome.

This contention was based on clinical observation of middle-class, heavy marijuana users referred to them for treatment. Conforming, achievement-oriented behaviour had changed to relaxed and careless drifting. Inability to concentrate for long periods, endure frustration, follow routines, and carry out complex, long-term plans, as well as apathy and loss of effectiveness, were noted. Such individuals became totally involved with the present at the expense of future goals. They had less objective productivity and seemed to withdraw subtly from the challenge of life (pp. 95, 98).

He reminds us, however, that no specific studies or case reports were cited to support McGlothlin and West's observations [2].

Other descriptions noted which apparently characterize this syndrome include: shift or decline in ambition; unproductiveness; aimlessness; poor class attendance; lack of goals; poor school performance; apathy and sluggishness in mental and physical responses; disorientation; flattening of affect; loss of interest in personal appearance; physical exhaustion; loss of time sense; difficulty with recent memory; mental confusion; and depression [14, 21, 22, 45, 46]. Nevertheless, in most cases symptoms disappeared if marijuana was discontinued suggesting not so much a syndrome but behaviour of chronically intoxicated individuals using their intoxicated state as a way of focusing their resentment of social and parental pressure. Moreover, Maugh states, from his summary of research conducted prior to 1974, that the amotivation symptoms listed above have been known to persist in some cases for up to 24 months after cessation of drug use.

Weller cites Halikas *et al's* summary of the medical literature which suggests a reduction in levels of sperm and testosterone in men as a result of chronic cannabis use [14, 21]. The latter change was observed in a closed ward situation with subjects at first showing no alteration in testosterone levels for about four weeks, followed by a subsequent and gradual drop in testosterone level which continued until cannabis intake stopped. This situation reversed itself on cessation of cannabis intake with levels beginning to rise after one week's abstinence. Weller concludes that "if testosterone affects aggression and drive, low testosterone might affect motivation. However, this relationship must be considered hypothetical without additional research (p. 102)."

Carlin and Post observed, in the 226 subjects they studied, an inverse relationship between levels of marijuana consumption and rate of employment, successful completion of school, present enrolment in school and the number of years of education completed [16]. A later study by Creason and Goldman affirmed this assessment when it was found that high school students who are heavy users and ex-users of cannabis are significantly lower on a behavioural measure of motivation than are casual and nonusers [17]. However, these authors suggest that "heavy marijuana use is limited to those who are already inclined to low motivation and depression" (p. 452) and in yet another, but related study, assessment was undertaken of 237 students in a Central European sports training facility for lifetime prevalence of amotivational syndrome [18]. This study, in contrast to that of Carlin and Post, reveals that 'amotivational syndrome' is not significantly associated with a history of marijuana use. In addition to the survey assessments provided by the above studies, Foltin *et al*, using an experimental design consisting of a structured performance task in the presence and absence of behavioural contingency requirements, found that in a comparison of cannabis users to no-drug and placebo conditions smoked marijuana was associated with a greater decrease in the use of time earned to perform high probability activities during contingency periods [19]. These findings are interpreted by the authors as evidence of an 'amotivational' effect which may result from repeated use of smoked marijuana.

In a large-scale study Mullins *et al* examined the drug consumption habits of recent conscripts into the United States Air Force who were, for the most part, young, healthy and not psychiatrically morbid [20]. The authors compared 2,842 US Air Force trainees who had used only cannabis with 1,843 who had used cannabis and/or other drugs and with a control sample of 9,368 on whom no drug-using information was available. Comparisons were made on five separate aptitude measures, on educational level attained prior to enlistment, and on three measures of performance of Air Force

duties. It was found that every mean score for the drug using groups was significantly different from its control counterpart at $p = 0.01$ or better. The most intriguing finding, in light of the authors' conclusion that cannabis causes an 'amotivational syndrome', is that for level of performance "all means are significantly lower than the control mean except the means for the cannabis-only group, which are significantly higher than the control means" (p. 4). Moreover, the authors argue that the differences between the cannabis-only group and the other drug groups, regarding level of performance, may be the result of the degree of drug use. They assert that multiple drug takers are more likely to be heavy users as opposed to the cannabis-only group which they claim are more likely to be light to moderate users. Thus, the lower means for the multiple drug groups are interpreted as resulting from the total overall consumption of drugs rather than the mixing of mind-altering substances which, like the mixture of cannabis and alcohol, may interact synergistically [6].

Congruent with the superior performance findings of Mullins *et al* are the results of Brill and Christie who observed, in a longitudinal study (1970-72) of marijuana use amongst 1,380 American college students, that a great majority either experienced "no effect" on adjustment or "improved" adjustment with only a small minority claiming their situation to be worsened [23]. In confirmation of this self-report evidence the students' grade-point averages showed no significant difference between cannabis user and non-user groups. In a similar study on a sample of 560 college students who were primarily cannabis-only users (85-90%), Goode found that grade-point averages for the casual and infrequent users to be higher than for non-users but slightly worse (non-significant) for heavy users as compared to abstainers [24]. This appears to suggest that 'amotivational syndrome' is not inevitable amongst a normal college population of marijuana smokers and the syndrome, if it exists, may be associated with heavy use only.

In his review of the cannabis literature Cohen reminds us that the 'amotivational syndrome' is so variable in presentation and is influenced by the magnitude and type of any premorbid pathology, that the very existence of such a syndrome must remain quite controversial [6]. On the other hand, it is the observation of both this author and Cohen that apparent lethargy and loss of ambition and goal orientation persist for some time during intervals of withdrawal from cannabis. In many cases this anergic condition is apparently reversed after months of abstinence, but Cohen reports that some clinicians recount what they believe to be the occurrence of permanent brain dysfunction in some subjects studied. However, it is interesting to note that Thurlow observed that cannabis users who

complained of apathy and loss of motivation improved when treated with antidepressant medication [25].

Another interpretation of the symptoms of 'amotivational syndrome' offered by some researchers is that it may be a facilitated depressive disorder which is brought to the fore by chronic, heavy cannabis use in a minority of pre-disposed individuals. Although Creason and Goldman argue for the existence of an 'amotivational syndrome', they conclude that marijuana consumption among adolescents exists across a wide range of youth groups, but heavy marijuana consumption appears to be limited to those who seem already inclined to low motivation and depression [17]. Kupfer *et al* draw a similar conclusion in an earlier study in which they compare 46 and 44 male undergraduates who were, respectively, heavy and light marijuana smokers [26]. However, their findings do not suggest any particular psychopathology associated with either group and these authors propose that heavy use of cannabis may be related to already existing depression which is, itself, the source of impaired motivation rather than frequent marijuana use.

Halikas *et al* also report a high incidence of depressive disorder in regular cannabis users who had smoked at least fifty times in the past six months before the commencement of the study [21]. Weller indicates that an examination of the subjects of that study reveals that most were young (mean age = 22 years), middle-class and had been smoking cannabis for an average of 2 years [14]. "Systematic evaluation revealed that most of their psychiatric problems predated marijuana use. About 18% had a history of definite or probable depression before significant marijuana use (p. 102)."

It should be borne in mind that the subjects of many of those studies which identify 'amotivational syndrome' as a product of cannabis use have been referred for treatment and hence do not represent the population of cannabis users in general. In fact, from the numbers given in many sources, those presenting with psychopathologies of any kind represent a very small minority indeed. For example, the 1991 National Campaign Against Drug Abuse survey of drug use in Australia reveals that 31.9% of Australians 14 years and older have tried cannabis at least once, 7.1% have used it within the past month, and 5.4% within the last week [44]. Thus, there are just under a million regular cannabis users in Australia who apparently function well enough so that most do not come to the attention of medical or legal authorities.³ Therefore, if 'amotivational syndrome' was a fact of cannabis use, Australian society would unmistakably feel its impact more directly and distinctly than is actually

³The total Australian population is approximately 17 million.

the case. One can only conclude that this supposed 'syndrome' may be, in part, the mis-labelling of a latent affect disorder which, in a small minority of unfortunate individuals, becomes manifest when facilitated by chronic cannabis use.

From the findings of Creason and Goldman, it appears that the effect of heavy cannabis use on motivation is not dependent on the presence of the drug in the user's system [17]. Although their work more precisely operationalizes the concept of 'motivation', which is central to the 'amotivational syndrome' debate, it is, perhaps, too narrow a definition when attempting to delineate the complex constellation of social-psychological changes seen in chronic cannabis users. For them motivation merely becomes

...the difference between the subject's performance on a task [solution of anagrams] when working for a reward and when the subject is not externally motivated [working for a reward]. A subject who performed better working for a reward than when not was considered more motivated than a subject who performed at the same level regardless of whether there was a reward at stake (p. 448). (Brackets mine)

From their results, in which they observed diminished motivation in heavy users and ex-users, they hypothesize the existence of a possible intervening personality variable as the possible distinguishing characteristic which separates those who are high users and high ex-users from casual or non-users and "that this factor is independent of present marijuana use while it does make the subject more likely to use marijuana" (17, p. 452). In conclusion they argue that there is good evidence in the research literature to suggest that intense cannabis use may be limited to those who have an inclination towards low motivation and depression. Unfortunately, these authors were not able to assess for any possible pre-existing psychiatric morbidity or personality differences which may have indicated either prior psychiatric conditions or differences in personality driven motivational levels in heavy users before the commencement of their cannabis habits.

Summarizing thus far: although researchers have apparently identified a group of cannabis consumers who undergo some changes in life-style and motivation, the existence of 'amotivation syndrome' as a nosological entity seems somewhat doubtful for at least five reasons. First, most studies cited thus far are unable to disconfound prior existing psychiatric morbidities from any effect directly caused by cannabis. Second, and closely related, is the difficulty in separating cannabis as catalytic facilitator of a covert but developing psychopathology from cannabis as causal agent in the onset of depression, loss of motivation, etc. Third, many of the studies examined above were conducted

without properly contextualizing the social circumstances of those being studied (e.g., Kolansky and Moore [45]). Research on motivation, adherence to educational courses and behaviour changes associated with cannabis use conducted in the 1960's and 1970's are confounded with the effect of changing social values, rebellious attitudes to the 'system' and alternative life-style worldviews which were prevalent at the times of those studies. Fourth, the research results on and pattern of this supposed syndrome contain too much contradictory evidence to pass the most basic test of empirical consistency required for sound scientific conceptualization as a single dynamic entity. Fifth, and most importantly from the perspective of this paper, no pre-test, post-test long-term longitudinal studies have been conducted which attempt to identify personality traits associated with chronic cannabis usage.

Returning to the interpretation of 'amotivational syndrome' as given in Creason and Goldman, it can be argued that the explanatory intervening personality variable posited by these authors (to account for increased cannabis use and subsequent loss of motivation in the cognitive, perceptual-motor tasks typically employed in most performance studies) is what Tellegen and Atkinson have called 'trait absorption' [4, 17]. It can be hypothesized that those who become heavy cannabis users (and show signs of 'amotivational syndrome') are doing so because the intoxicant properties of THC augment and facilitate this given personality trait in a manner which is self-rewarding. Of course, the inherent danger of any self-rewarding system is the formation of an uncontrollable positive feedback loop which leads to ever increasing levels of consumption of the facilitating substance - in this case cannabis.

It is being hypothesized herein that the so-called 'amotivational syndrome' does not represent a specific psychiatric nosology but is, rather, the combination of two general factors arising from heavy cannabis use brought about by a personality-need driven positive feedback loop. With regular cannabis use is observed:

- 1) a change in cognitive style to a more 'absorptive' state in which externally driven reward systems no longer predominate with subsequent reduction in a user's level of achievement motivation; and
- 2) the development of depression which sometimes ensues either as a consequence of a prior existing pathology or as a result of the user being unable to sustain the desired 'absorption' state for reasons arising as a result of social circumstances, changing self-concept engendered by the cannabis-induced state and/or the development of increased tolerance to the effects of THC.

However, before discussing the possible mechanisms entailed by the above hypotheses, the personality factor of 'trait absorption' requires further elucidation.

TRAIT ABSORPTION

It has been argued in recent years that ‘flow’ states of consciousness and/or ‘absorption’ experiences may represent a basic human personality trait which has, as its primary drive, the need to experience the world in a self-absorbed state of consciousness which is *intrinsically self-rewarding* [4, 5]. This need varies from one individual to another and, in some, the achievement of this state may become an end in itself. Tellegen and Atkinson describe the origins and qualities of what they call trait absorption.

Phenomena of this kind, while apparently overlooked by contemporary academic treatments of attention, perception, and memory, have been described and discussed widely in literature on meditation, expanded awareness, peak experiences, mysticism, aesthetic experience, regression in the service of the ego, altered states of consciousness, and in the literature on drug effects. For example, Maslow spoke of the “fascination” and “complete absorption” that characterize peak experiences [27]. Schachtel, to whom Maslow refers, described the “allocentric” perceptual mode as involving “totality of interest” [28, p.221], and openness to the object in all its aspects with all one’s senses, including one’s kinesthetic experience. We suggest, in a similar vein, that the attention described in Absorption items is a “total” attention, involving a full commitment of available perceptual, motoric, imaginative and ideational resources to a unified representation of the attentional object (p.274).

The absorptive state favoured by those with high levels of trait absorption is the likely basis for all ‘flow’ experiences. In this state of consciousness the individual’s attentional resources are focused in such a manner as to enter wholly into whatever is in awareness, whether the focus be interoceptive or exteroceptive [29]. This totality of awareness on the side of the ‘object’ has been called by Sartre and other phenomenologists ‘unreflected’ consciousness [30]. Most of our waking state is spent in ‘reflected’ consciousness in which attentional resources are divided between the ‘object’ and ‘self-as-object’ so that we are simultaneously experiencing the ‘object’ and ourselves doing the experiencing.⁴ It is in this latter state that experience becomes memory and hence knowledge and it is also in this state that we operate in what is generally understood to be our normal linguistic, discursive mental processes which includes our usual awareness of the passage of time [31].

⁴Thomas Nelson also refers to the cognitive activity of self-reflection as ‘metacognition’ [49]

Irwin further discriminates between the ‘capacity’ and ‘opportunity’ for ‘absorption’ as determining whether individuals engage experiential states which are derived from deploying attentional resources in this particular way [32]. Further, the ‘capacity’ for engaging in ‘absorptive’ states has been standardized as a personality construct and is therefore measurable as a scale (Absorption) on a self-administering personality instrument - the Tellegen Differential Personality Questionnaire, and this personality ‘capacity’ has been found to be able to successfully differentiate levels of hypnotic susceptibility as well as frequency and type of reported spontaneous mystical, visionary, and paranormal experiences [4, 32, 33, 34, 35, 47].

Finally, trait absorption may underlie what Weil has argued is a fundamental need in Homo Sapiens across cultures and time: the drive to engage altered states of consciousness for both ritualistic and creative developmental purposes [15]. In traditional societies, such as once existed amongst the Yakut of Siberia and the Australian Aborigines, an individual with a strong natural proclivity for altered state experiences would be, as a matter of course, chosen for a life-role as shaman or ‘clever man’ [36, 37]. However, this role no longer exists in the developed countries of the late Twentieth Century. Thus, individuals who possess high ‘trait absorption’ and/or are inclined toward spontaneous ‘absorptive’ and trance experiences may find themselves making a “deviant role exit” into alternative lifestyles, such as the cannabis sub-culture, more frequently than those with less ‘absorptive’ ‘capacity’ in order to create greater ‘absorptive’ ‘opportunity’ [32, 38].

A RECONCEPTUALIZATION OF THE RELATIONSHIP BETWEEN TRAIT ABSORPTION AND AMOTIVATIONAL SYNDROME

In contrast to the view that cannabis is psychologically dangerous in itself, Weil has argued that it should be understood to be what he calls an “active placebo” [15].⁵ Weil describes an “active placebo” as “a substance whose apparent effects on the mind are actually placebo effects in response to minimal physiological action” (p. 95) rather than being a direct cause of the psychological changes seen in users. This effect is attested to, empirically, by the wide variety of responses individuals make to similar batches of cannabis in similar situations. Weil’s notion, based on hundreds of clinical observations, led

⁵A careful distinction should be drawn between the possible harmful effects of Tetrahydrocannabinol (THC), the primary intoxicant in cannabis, and the burnt by-products of smoked marijuana. There are definite physiological dangers to the cardio-pulmonary system from smoking most plant leaves and marijuana is no exception, but there is no such clear-cut evidence for permanent, harmful effects of THC on the central nervous system nor is there unequivocal evidence that THC intoxication leads to psychological damage in humans.

him to argue that it was highly unlikely that cannabis alone could be responsible for the very varied psychological responses and effects which he observed. He provides a useful insight into the reasons for the varied outcomes seen across cannabis motivation studies.

Because marijuana is such an unimpressive pharmacological agent, it is not a very interesting drug to study in a laboratory. Pharmacologists cannot get a handle on it with their methods, and because they cannot see the reality of the nonmaterial state of consciousness that users experience, they are forced to design experimental situations very far removed from the real world in order to get measurable effects. There are three conditions under which marijuana can be shown to impair general psychological performance in laboratory subjects. They are: (1) by giving it to people who have never had it before; (2) by giving people very high doses that they are not used to (or giving it orally to people used to smoking it); and (3) by giving people very hard things to do, especially things that they have never had a chance to practise while under the influence of the drug. Under any of these three conditions, pharmacologists can demonstrate that marijuana impairs performance (p. 86).

It has been argued that most altered states of consciousness, such as those produced in hypnosis, meditation and ecstatic experiences, involve deployment of attention in unique ways with a particular emphasis on the present [29, 40, 41]. This 'unreflected', unselfconscious attentional state, which is focused primarily in the 'now', will, whether induced by drugs or not, interfere with the normal memory processes associated with the 'reflected' conscious state which is required for discursive thought and logico-temporal activities usually associated with memory and task performance.

Thus, this paper would argue that any discussion of motivation and THC use (and its relationship to memory acquisition and performance) must consider the possibility that THC facilitates a free-floating 'absorptive' state which favours engagement in spatial-metaphoric cognitive styles of the 'unreflected' 'here and now' style of consciousness. This is partly confirmed by the findings of Fabian and Fishkin who observe in their study of cannabis and 'trait absorption' that

...marijuana users, when asked to specifically reference the marijuana-high state, report a greater number of absorbing experiences than when not specifically asked to reference the marijuana state and when specifically asked to exclude all drug-related experiences [42, p. 548].

It is thus possible that the apparent memory deficits associated with 'amotivational syndrome' seen in individuals intoxicated with THC and, who are being required to perform and attend to verbal,

temporal, logico-deductive activities, are the result of 'time-sharing' between the two states of 'reflected' and 'unreflected' consciousness. The effect of this 'switching' is to disrupt the usual cognitive and memory consolidation processes by constantly interrupting the continuity of attention necessary for the completion of the memory process. This 'time-sharing' can be conceptualised as a temporary and rapid movement out of the cannabis-induced 'unreflected' state of consciousness (absorptive state) into 'reflected' consciousness when sufficient 'demand' is present calling the experient's attention to the temporal, discursive information stream. As soon as demand falls below some critical threshold required for attention, the 'unreflected' state resumes thus disrupting any on-going consolidation and learning process. The laying down of short-term memory and the ability to attend accurately to objective (clock) time require a certain level of continuous background 'self-observation' and rehearsal - which is a central part of 'reflected' state activity. Therefore, assigning the cause of memory deficits measured in THC intoxicated individuals to the direct pharmacological action of cannabis may be an attribution error with cannabis being primarily a catalyst (active placebo) for these altered states which are the actual cause of the failure to process discursive information in the usual way into long-term memory.

The self-rewarding quality of this absorptive state will naturally lead to the cannabis user preferentially returning to absorptive behaviours and cognitive styles over and again. Of course, this will lead, no doubt, to a loss of concentration on any performance task in process, thereby creating a background of anxiety associated with the failure at whatever chore the cannabis user is currently engaged. Naturally, this will facilitate further and more frequent returns to the absorptive state since it will be experienced as rewarding and the demand of the performance activity as aversive. No doubt, in time, the preference for the former state will lead to a diminished capacity to perform in many areas of daily activity which would likely cause considerable frustration in the experient. This state of affairs will very likely lead, in time, to the generation of a sense of learned helplessness which undoubtedly will exacerbate any depressive reaction or existing on-going depression.

Weil has argued that our natural proclivity for altered states of consciousness traditionally has been facilitated in many cultures by the ingestion of psychoactive substances such as marijuana and hashish [15]. Although this drug 'high' was once accepted as one in a range of possible states which humans might rightfully achieve, this is certainly no longer the case in the West. Thus, the negative reporting, vis-à-vis cannabis and performance, may now be reconceptualized as a value judgement regarding the type of mental state and hence style of cognitive performance deemed useful and proper

by today's social standards. Put more directly, researchers are testing cannabis users on tasks which represent current biases, thus allowing their research to reflect the prejudices of their times.⁶ In other historical and cultural contexts chemically and contemplatively induced altered states of consciousness have been highly valued and it is arguable that most religious traditions have drawn their deeper insights and inspiration from these experiences.

The capacity of altered state experiences to open broader existential perspectives and, hence, new life meanings appears to be part of a growth process intrinsic to both spiritual and creative life. Further, it can be argued that these types of altered state experiences are necessary in the facilitation of personal renewal and the relief of psychological suffering. Although most of the major world religious traditions have developed methods for achieving these altered states without the use of pharmacological agents, in the age of 'high-tech' medicine, and in the context of little social or religious support for those 'talented' in the production of altered state experiences, the adoption of chemical substances and the attendant association with deviant social groups for these ends should not be surprising.

The psychiatrist Arthur Deikman suggests that the bifurcation of consciousness into 'observing' (objective - 'reflected') and 'experiencing' (receptive - 'unreflected') selves is common for most people living in the West today [43]. It is the denial of the latter mode, the source of our capacity for mystical experience, which is the basis of our current psycho-spiritual crisis and, arguably, the underlying psychological cause of our destructive alienation from nature. He asserts that without the cultivation of the 'experiencing self' we may fail to enter into mystical awareness and therefore be unable to remedy the psychopathology innate to our present condition. Thus, from the position advocated by Deikman and from the previous discussion, the use of cannabis in our modern industrialized societies can be reconceptualized away from the notion of a public health issue, to the understanding that its use is deeply connected to the seeking of personal renewal or the fulfilment of unmet spiritual needs, which users attempt to fulfil, albeit inadequately, through ingesting the drug.

⁶It is for this reason that Nelson and Howell have advocated closer scrutiny of contextual biases when doing social science research [48].

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