

## Sensation Seeking Level and Drug of Choice

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The sedating and arousing central nervous system effects of drugs have long been inferred to be factor in their illicit use and abuse of addictive substances. Sensation Seeking is an important global biological based trait of personality related to substance abuse; specifically preference for a particular drug is, in part, a function of arousal-seeking and stimulus-screening characteristics. The main objective of this study was to measure the level of sensation seeking among different kinds of substance abusers and non-abusers. Indian Adaptation of Sensation Seeking Scale, form S was used to assess the sensation seeking level of substance abusers and non-abusers. The study was carried out with four groups of substance abusers (N=120) namely cannabis, alcohol, heroin and multiple drug along with a control group (N=120). The results of the study suggested that substance-abused group tend to had greater arousal seeking tendencies and significantly scored higher on the Sensation Seeking Scale as compared to non-substance abused group. Results further suggested that across the four groups of substance abusers multiple drug abusers scored higher on Thrill and Adventure seeking, Experience Seeking and Disinhibition subscales of the SSS as compared to other three groups of substance abusers. Heroin abusers scored higher on Boredom Susceptibility subscale of the SSS. Additionally, this study also found a relationship between type of substance abuse and pattern of substance consumption i.e. frequency, duration and age of onset.

**Keywords:** Substance abuse, Drug-Choice, Sensation-Seeking level.

Different drugs and substances are chemically different and have different physical and psychological effects, and also have different consumers. Sensation seeking construct has consistently attracted widespread attention of researchers in the area of substance abuse (Caldwell & Sever, 1974; Stephenson, Morgan, Lorch, Palmgreen, Donohew, & Hoyle, 2002; Peele, 1981, Yanovitzky, 2005; Zuckerman, 1979).

Zuckerman (1979, 1987) has introduced the trait of sensation seeking which is similar to impulsivity in Eysenck's and Cloninger's models. Sensation seeking is a biologically based personality dimension. This is based on the theory of optimum level of arousal which postulates that every person has a

preferred level of stimulation required for reaching states of arousal that maximize affective, cognitive and motor functioning. Sensation seeking has been defined as "the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, 1979). This psychological construct is generally measured with Zuckerman's Sensation Seeking Scale (Zuckerman, 1979). Researches demonstrated that the Sensation Seeking Scale (SSS) has been useful in identifying characteristics of individuals who abuse drugs or alcohol. Elevated the SSS scores were related to higher levels of drug abuse among college students (Jaffe &

Archer, 1987) and chronic drug abusers (Kilpatrick, Sutker, Roitzsch, & Miller, 1976).

Theoretical attention and researches have been consistently directed to the relationship between addictive behavior and arousal (Andrucci, Archer, Pancoast, & Gordon, 1989; Hodgson & Miller, 1982). Addicts who were higher in sensation seeking also used more categories of drugs, had an earlier age of onset of first drug use, and cited curiosity as their initial motive for using drugs (Sutker, Archer, & Allain, 1978). Interestingly, it was observed that high sensation seeking adolescents engage in such activities (e.g., association with deviant peers) that may increase their risk for drug use (Yanovitzky, 2005).

Since two of the Sensation Seeking Scales contain some reference to drug abuse named as Experience Seeking (ES) and Disinhibition (Dis), correlations with these subscales alone would be suspected. But an early study reported that drug use correlated with the general and all the subscales of the SSS in college females, and with all but the Dis scale in males (Zuckerman, 1972). Segal, Huba, and Singer (1980) argued that the Experience Seeking (ES) and Disinhibition (Dis) subscales were highly predictive of drug abuse as compared to other personality scales. In a similar study, Kilpatrick et al. (1976) reported that the SSS, particularly the ES, Dis and Boredom Susceptibility (BS) were the best concurrent predictors of regular drug use. Pedersen (1991) has found that different sub-dimensions of the sensation seeking trait were strong predictors of future drug use: (Dis) was a general drug use factor in both sexes. 'Thrill and adventure seeking' (TAS) predicted moderate alcohol consumption in boys. 'Experience seeking' (ES) predicted cannabis use in boys.

The basis for relationship between drug abuse and sensation seeking is, however, an unresolved issue (Huba, Newcomb, & Bentler, 1981; Kohn, Barnes, & Hoffman, 1979). Many

studies reported that high sensation seekers prefer stimulants, whereas low sensation seekers prefer depressants, both choices being designed to move people up or down respectively towards their optimal level of arousal (Carrol & Zuckerman, 1977; Milkman & Frosch, 1980). Another group of studies suggested that high sensation and experience seekers appreciate altered states of consciousness more than low arousal levels.

According to the earlier optimal level theory (Zuckerman, 1978), the higher sensation seekers should prefer drugs that stimulate arousal levels rather than drugs that depress arousal level. In a study Zuckerman (1979) noted that high sensation seekers were distinguished from mediums and low arousal level on use of marijuana, hashish, amphetamines, cocaine and LSD, but not on barbiturates, opium, heroin, morphine or tranquilizers.

Persons who preferred CNS depressant drugs tended to desire lower arousal, and those those who used CNS stimulating drugs tended to prefer greater arousal level (Galizio & Stein, 1983; Kohn & Coulas, 1985; Milkman & Frosch, 1980). In an extensive study, Carrol and Zuckerman (1977) observed that stimulant use was positively and significantly related to traits of the Dis and BS. Disinhibitor sought the high level of physiological arousal induced by amphetamines. Hallucinogen involvement was also associated with the trait of Dis. Depressant abusers tended to score low on the ES. These individuals did not use drugs to seek out novel forms of experience, but to reduce unwanted excessive environmental (both internal and external) stimulation. Kern, Kenkel, Templer, and Newell (1986) found that individuals who preferred CNS stimulants tended to have greater arousal-seeking tendencies and lower external screening ability than those who preferred CNS depressants.

Many earlier research findings showed

that opiate addicts would be higher sensation seekers as compared to non-drug abusers (Platt, 1975; O'Connor & Berry, 1990). Basu, Varma, Malhotra, and Malhotra (1995) reported in their study that the opiate addicts were significantly higher in total sensation seeking and some of its components, evaluated by subscale scores than in either of the control groups. Further they found that a significantly higher degree of alienation in the experimental group than in either of the control group. Kern, et al. (1986) conducted a study on substance abusers belonging to variety of drug groups which included opiates, alcohol, hallucinogen, depressants, stimulant, PCP, and inhalants as measured on the Sensation Seeking Scale and found that individuals who preferred CNS stimulants tend to have greater arousal-seeking tendencies and lower external screening ability than those who preferred CNS depressants. Opiate users preferred to align more closely with stimulant preference than alcohol groups. Preference of hallucinogens were higher in internal stimulus screening than all other drug preference groups. In a similar study it was reported that marijuana abusers scored higher on Sensation Seeking scale in comparison to alcohol and nicotine abusers (Martin, Kelly, Rayens, Brenzel, Smith, & Omar, 2002).

O'Connor, Berry, Morrison, and Brown (1995) conducted a study on recovering drug users with three or more months abstinent from drugs. Subjects were divided according to drug preference as opiate, stimulants, marijuana, alcohol and a polydrug preference and found that opiate users were significantly higher in susceptibility to boredom, alcohol misusers compared to a combined stimulant, opiate and polydrug group were significantly lower in extraversion and boredom susceptibility. Subjects raised in drug-alcohol using families scored significantly higher on neuroticism.

Mattoo, Varma, Singh, Khurana, Kuar,

and Sharma (2001) carried a study on alcohol, opioids and both mixed group dependent individuals. They administered the SSS and found that compared to the normative data, all the three drug groups had higher scores for Total Scale, BS subscale, and lower scores for the TAS and ES subscales.

Addiction begins with drug abuse when an individual makes a conscious choice to use drugs, but addiction is not just "a lot of drug use". The drug experience is subjective and it varies from time to time and from person to person. Preference among alternative drugs can be conceptualized as an intervening variable that results from interactions among the user's psychological characteristics (including personality, attitudes and expectations), situational variables, and differences in the psychopharmacological effects of specific types of drugs. According to Zuckerman (1978) the types and number of drugs used have also been considered as a reflection of the user's need to regulate levels of arousal. In the view of earlier research studies, it was apparent that there were controversies among research findings. One view point had been that sensation seeking was more related to the variety of drugs used and to drug use per se than to any specific type of drug preference (Zuckerman, 1987). Another view was that sensation seeking behavior was substance specific (Platt, 1975; O'Connor et al., 1995). During the past decades, enormous researches conducted in different parts of the world and have accumulated a rich data base that generally validates the concept of sensation seeking in the studies of substance abuse, whereas in India, very fewer studies have been conducted for utilizing this psychological concept (Basu, Verma, Malhotra, & Malhotra, 1993).

In the context of these issues, the present study investigates the level of sensation seeking among substance abusers and non-

substance abusers. Further, the study explores differences across the subgroups of substance abusers on the subscales of sensation seeking. It also focuses on substance abuse pattern and its relationship with substance-abused behaviour.

### Method

#### **Sample:**

The study is based on the ex-post-facto design. Two groups were taken, one is experimental group (N=120) and another is control group (N=120) (normative data). The experimental group consisted of four subgroups of drug abusers named as heroin, alcohol, cannabis, and multiple drug users. Both experimental and control groups were matched on the variables of age, sex, education and socio-economic status. The sample consists of 120 (aged 18 years and above) adult males who were chronic drug abusers of different kinds of drugs namely heroin, alcohol, cannabis, and multiple drugs. The sample was drawn from the General Psychiatric Unit (O.P.D.) of University Hospital (Banaras Hindu University). Sample size of different kinds of drug abusers was 30 for each drug group. Substance dependence was diagnosed according to International Classification of Diseases, 10th Revision (World Health Organization, 1992). The case finding sampling method was used. In this method general psychiatric unit was approached to furnish data on all clients satisfying certain criteria of drug abuse. The inclusion criteria was period of drug intake supported by information from the physician, family members and peer group. A group of normal subjects (N=120) who never practiced any psychotropic drugs was also selected by matching the variables i. e. age, gender, education and socio-economic for comparative study. Patients were screened for the sample only after their registration and

diagnosis by the consultant.

#### **Measures:**

**Sensation Seeking Scale (Indian Adaptation):** Indian adaptation by Basu, Verma, Malhotra and Malhotra (1993) of sensation seeking scale was used. Originally this scale was developed by Zuckerman, Kolin, Price, and Zoob (1964). It is a 40 item forced choice inventory where each represents a tendency towards sensation seeking propensity and has two statements (marked A and B) indicating higher or lower sensation seeking. Besides a Total Scale Score, 10 items each provides four subscales named as Thrill and adventure seeking (TAS), Experience Seeking (ES), Boredom Susceptibility (BS) and Disinhibition (Dis). Obtained internal consistency (by using Pearson's product moment correlation method) of this scale was ranged between .05 to .76. Its reliability was checked by test-retest method. Discriminant validity of the modified SSS was also checked.

### Results

A view of the Table 1 demonstrated that, Substance abusers scored significantly higher than non-substance abusers on all subscales of Sensation Seeking Scale (\*\* $p < .01$ ) except Thrill and Adventure Seeking. This implies that substance abusers scored significantly higher on Boredom Susceptibility, Experience Seeking and Disinhibition scales as compared to non-substance abusers. On Total Sensation Seeking Scale, substance abusers scored significantly higher than the non-substance abusers (\*\* $p < .01$ ). No significant difference was obtained between substance abusers and non-substance abusers on Thrill and Adventure Seeking, although normal subjects scored higher on this subscale as compared to substance abusers.

**Table 1. Mean Scores, SDs and t-values of Sensation Seeking Scores (SSS) of Substance Abused Group and Non-Substance abused Group**

Subscales of Sensation Seeking	Drug Abused Group (N=120)		Non Drug Abused Group (N=120)		t-value
	Mean	SD	Mean	SD	
Thrill and Adventure Seeking	4.62	1.26	4.73	0.96	0.84
Experience Seeking	4.76	1.13	4.28	1.46	2.66**
Disinhibition	4.41	1.59	3.36	1.68	4.90**
Boredom Susceptibility	4.26	1.76	2.98	1.99	5.33**
Total SSS	4.59	1.47	3.95	1.58	3.26**

\*p<.05, \*\*p<.01

Obtained values of 'F' shows significant difference among the subgroups of substance abusers on all the subscales of Sensation Seeking. F-ratios came to be F(3,116)=2.87;p<.05, F(3,116)=3.72;p<.05, F(3,116)=3.25;p<.05, and F(3,116)=3.04; p<.05, for the Thrill and Adventure Seeking,

Experience Seeking, Disinhibition, and Boredom Susceptibility respectively.

To further ascertain the significance of mean differences between the subgroups of substance abusers on the sensation seeking scores Duncan multiple range test was computed.

**Table 2. Significance of Difference between Substance Abused Groups on Thrill and Adventure Seeking Scale ( Duncan Range Test)**

Thrill and Adventure Seeking	Mean	Heroin	Alcohol	Cannabis	MultipleDrug
		4.13	4.6	4.66	5.07
Heroin	4.13	-	0.47	0.53	.94**
Alcohol	4.6		-	0.06	0.47
Cannabis	4.66			-	0.4
MultipleDrug	5.07				-

\*p<.05, \*\*p<.01

**Table 3. Significance of Difference between Substance Abused Groups on Experience Seeking Scale (Duncan Range Test)**

Experience Seeking	Mean	Heroin	Alcohol	Cannabis	Multiple Drug
		4.3	4.6	4.96	5.16
Heroin	4.3	-	.3	.66**	.86**
Alcohol	4.6		-	.36*	.56**
Cannabis	4.96			-	.20
MultipleDrug	5.16				-

\*p<.05, \*\*p<.01

It was observed from the above Table 2 that the multiple drug abusers differed significantly from heroin abusers on Thrill and Adventure Seeking (\*\*p<.01). This indicates that heroin abusers had less desire to engage in risk- taking activities as compared to multiple drug abusers. On Experience Seeking subscale, cannabis abusers differed

significantly from alcoholics (\*p<.05) and heroin abusers (\*\*p<.01). It was also found that multiple drug abusers differed significantly from alcoholics and heroin abusers (\*\*p<.01). This suggests that heroin and alcohol abusers reported less desire to seek new experiences as compared to multiple and cannabis abusers.

**Table 4 Significance of Difference between Substance Abused Groups on Disinhibition Scale ( Duncan Range Test)**

Disinhibition	Mean	Heroin	Cannabis	Alcohol	MultipleDrug
		3.73	4.4	4.53	4.97
Heroin	3.73	-	.67*	.8	1.24**
Cannabis	4.4		-	.13	.57
Alcohol	4.53			-	.44
MultipleDrug	4.97				-

\*p&lt;.05, \*\*p&lt;.01

**Table 5 Significance of Difference between Substance Abused Groups on Boredom Susceptibility Scale ( Duncan Range Test)**

Boredom Susceptibility	Mean	Alcohol	MultipleDrug	Cannabis	Heroin
		3.8	4.63	4.8	5.1
Alcohol	3.8	-	.83	1.00*	1.3*
MultipleDrug	4.63		-	.17	.47
Cannabis	4.8			-	.3
Heroin	5.1				-

\*p&lt;.05, \*\*p&lt;.01

On Disinhibition scale, heroin abusers differed significantly from cannabis (\*p<.05) and multiple drug abusers (\*\*p<.01). This indicates that heroin abusers showed less aversion for repetitive experiences of any kind and routine work in comparison to other three groups of abusers.

Table 2 (d) shows that alcoholics differed significantly from cannabis and heroin abusers on the Boredom Susceptibility scale (\*p<.05). This indicates that alcoholics had less aversion for repetitive experience of any kind of routine work.

#### **Drug Abuse pattern and History:**

With reference to drug abuse pattern and behavior given in Table 4. An inspection of this Table shows that on an average heroin intake was 2-4 times per day. In the present sample, heroin intake was never more than 4 times a day because heroin is very potent drug and its effect last for 4-6 hours as compared to the other three groups of addictive substances. Therefore 60% heroin abusers took heroin 2-4 times per day. In the present data, alcoholics reported that

frequency of their alcohol intake was generally depended on its availability. Fifty percent of multiple drug abusers reported that they used to take addictive substances for 6-10 times. They reported that they always experienced craving for addictive substances. Further, it was apparent from the Table that the 30% of alcoholics had a long history (above 10 years) of alcohol abuse as compared to other three groups of substance abusers.

Personal data schedule was framed to elicit information on several aspects of drug abuse. One of the important aspects of drug abuse is reason of abuse. In this personal data schedule some questions are framed regarding the abuse of addictive drugs, Like 'how were you introduced to drugs? Moreover, what was the specific reason to abuse these drugs? A variety of responses were received from different kinds of drug abusers. Irrespective of the type of substances they had been abusing most of the drug abusers reported that initially they started substance abuse on persuasion of peer group or in order to give them company in the abuse of drug.

### Discussion

Sensation seeking, a psychological construct, had been related to various psychological and personality traits, cognitive styles and different types of experience such as experience with drugs, sex, alcohol, smoking, food preferences, design preferences and volunteering for unusual activities and experiments (Kern et al., 1986; Pedersen, 1991). In clinical settings, the majority of researches have been conducted on the relationship between sensation seeking and substance abuse (Andrussi et al., 1989; Hittner, 2006; Zuckerman, 1987).

Findings of the present study revealed a significant positive relationship between sensation seeking behavior and substance abuse which corroborate with earlier existing researches (Jaffe & Archer, 1987; Kosten, Ball & Rounsaville, 1994; Lang, Shin, & Lee, 2005; Peele, 1981; Perkins, 1990; Segal et al., 1980) portraying that the drug abusers scored significantly higher on the SSS as compared to normals. However, our data directly contradict some studies (Hobfall & Segal, 1983; Kern et al., 1986) which mentioned a variable differential relationship between sensation seeking and use or abuse of different substances like depressants, stimulants or hallucinogens, individually or in combination.

Which subscales contribute to sensation seeking in substance abusers?, Earlier researches have reported higher sensation seeking being contributed by Disinhibition (Basu et al., 1993; Kohn & Coulas, 1985; Pedersen, 1991), Experience Seeking and Thrill and Adventure Seeking (Pedersen, 1991; Zuckerman, 1978), and Experience Seeking only (Marvel & Hartman, 1986; Segal et al., 1980). In contrast, in the present study, it was found that subscales of the SSS namely Experience Seeking, Boredom Susceptibility and Disinhibition had a significant role in substance abuse. It can be said that, in general, substance abusers were looking for

unconventional experiences, have seeking sensation by casting off inhibition through activities and dislike repetitive experience of any kind. Hence it can be interpreted addictive behavior in terms of sensation seeking level, when an individual's stimulation level is too low, as in perceptual isolation, may lead an individual to increase stimulation and he/she may take action to increase his/her stimulation level (Zuckerman, 1974). This may be expressed in terms of disinhibition and experience seeking where an individual looks for new experiences through drugs or alcohol. If this individual's current level of stimulation is too low, he/she may choose to drink an excessive amount of alcohol to increase his/her stimulation level. Zuckerman et al. (1964) suggested that an individual's optimal level of stimulation may be usually high. This large appetite for sensation may also lead one to seek an abnormal amount of it. These individuals may choose alcohol/addictive substances to relieve their low level of stimulation and abuse addictive substances to magnify its effects and restore their equilibrium (Carroll, Zuckerman, & Vogel, 1982; Zuckerman, 1974).

A number of clinical studies have supported that the preference for a specific drug is not random, but rather, appears to be a process of self selection (Dorus & Senay, 1980; Khantzian & Treece, 1985). This course of selection has also been referred as preferential drug use (Milkman & Frosch, 1980) and the drug of choice phenomenon (O'Connor et al., 1995). In the present study an attempt had been made to know a more specific question, did subscales of the Sensation Seeking Scale are substance specific in terms of substance abuse. Across all the four kinds of substance abusers, the finding demonstrated that multiple drug abusers scored significantly higher on Thrill and Adventure Seeking, Experience Seeking and Disinhibition subscales of the SSS. This suggested that multiple drug abusers needs

more elaborate stimulation and unconventional experiences and they look for new experiences through drugs or alcohol as compared to other three groups of substance abusers. On these three subscales of the SSS, heroin abusers scored lower because they do not use drugs to seek out novel forms of experiences, but to reduce unwanted, excessive environmental stimulation. Thus they prefer or appreciate dampening effect on sensation and perception. Further, the finding also supported that heroin abusers significantly scored higher on boredom susceptibility subscale of the SSS because they cannot tolerate boredom and want to change.

The study has clearly demonstrated that different kinds of substance abusers had different drug abused pattern and history. Data showed that age of onset for substance abuse generally ranged between 15-23yrs age group, which implies that younger initiator may be at even greater risk for regular, multiple, increased and problem related use. These findings are also consistent with earlier researches (Hubbord, Brownlee, & Anderson, 1988; Satija, Bhukal, Nathawat, Gupta, & Sharma, 1991). It was also apparent that cannabis abusers started cannabis abuse more early as compared the other group of substance abusers. Multiple drug abusers had more frequency of substance abuse per day as compared to other three groups of substance abusers, while alcoholics had a longer history of alcohol consumption.

Earlier studies reported that curiosity and peer pressure were the main reasons for starting substance abuse (Crjervuldsen, Myrvang & Opjordsmoen, 2003; McNeil, 1992; Newcomb & Felix-Ortiz, 1992). In the present study peer group was reported as a major variable for initiation of substance abuse. Heroin abusers were more influenced by peer group.

In summary, the present study

demonstrates that substance abused group significantly scored higher on the Sensation Seeking Scale, which suggest that they have greater arousal or higher sensation seeking tendencies as compared to non-substance abused group. Multiple drug abusers scored higher on Thrill and Adventure Seeking, Experience Seeking and Disinhibitor subscales of the SSS as compared to other three groups of substance abusers. Heroin abusers scored higher on Boredom Susceptibility subscale of the SSS. Cannabis abusers had more varied sensation seeking profile. The study also found a relationship between type of substance abuse and pattern of substance consumption i.e. frequency, duration and age of onset.

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