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The Drug-of-Choice Phenomenon: Psychological Differences among Drug Users Who Preferred Different Drugs

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ABSTRACT

The Eysenck Personality Questionnaire, the Sensation Seeking Scale, and the Brief Symptom Inventory were administered to 125 recovering drug users with three or more months abstinent from drugs. Subjects were divided according to drug preference: opiates, stimulants, marijuana, alcohol, and a polydrug preference. Opiate users were significantly higher in Susceptibility to Boredom. Alcohol misusers compared to a combined stimulant, opiate, and polydrug group were significantly lower in Extroversion and Susceptibility to Boredom. Subjects raised in drug/alcohol-using families scored significantly higher on Neuroticism and on the Positive Symptom Total of the BSI, and had a higher rate of suicidality.

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INTRODUCTION

The relationship between drug preference and psychological variables is of long-standing interest to researchers in the fields of substance misuse and personality. Both personality and psychopathology have been studied in relation to drug preference. Many clinicians have been influenced by the "self-medication" theory of addiction, which suggests that people use drugs to regulate uncomfortable feeling states or distressing psychological symptoms (Bell and Khantzian, 1991). For example, it has been postulated that people use opiates to regulate rage, and stimulants to cope with depression (Khantzian, 1985). This hypothesis is based primarily on clinical observations, and is questioned by some researchers. Others have suggested that disturbances commonly associated with use of specific drugs may sometimes be the result of the pharmacological effects of recent drug use or withdrawal (Mirin et al., 1988; Vaillant, 1981; Babor et al., 1990).

There are several problems in demonstrating an association among drug preference and personality and psychopathology. First, there is often a failure to distinguish between personality and psychopathology. Second, with few exceptions, most prior studies have been confounded by current or recent drug use and/or withdrawal. Third, drug use always involves personality, drug effects, and social and economic factors, all of which may affect drug preference. Drug-of-choice research focused on psychopathology and personality may be confounded by the social and economic forces contributing to drug use (Heath, 1990; Inaba and Cohen, 1989; Inaba, personal communication, 1991).

Several empirical studies have reported symptomological or personality differences among users who prefer different drugs (Pittel, 1971; Henriques et al., 1972; Milkman and Frosch, 1973; Carrol and Zuckerman, 1977; McLellan et al., 1979; Galizio and Stein, 1983; Rosenthal et al., 1990). The variability of measures, and the lack of consistency of results even when the same measures have been used in different studies, suggests that there is no replicable pattern to be found in any particular drug user group. Furthermore, each study often employed combinations of drug groups. Additionally, these studies assessed the personality traits and psychopathology of the differing drug user groups when the subjects were either still using or withdrawing from drugs. Thus their results may have been confounded by the effects of drug use and drug withdrawal. In fact, studies have reported changes over time in psychopathology in people recovering from drug use (Brown, 1977; DeSoto et al., 1985; Verinis et al., 1986). O'Connor et al. (1992) reported that users across

all drug groups describe a significant increase in psychological symptoms while using drugs, and a decrease in the postaddiction months and years.

In a study of drug preference, O'Connor and Berry (1990) attempted to control for the effects of recent drug use and withdrawal by including subjects with a wide range of time abstinent. They found groups differing in reported physical reasons for use, but not in emotional reasons. This present study examined psychological differences between recovering users with different drug preferences, using measures of personality traits and measures of psychopathology. This study differed from prior studies by addressing the confound of recent drug use by including only recovering users of drugs and/or alcohol who had been abstinent for 3 months or longer.

METHOD

Subjects

The subjects were 125 recovering drug users, 76 males and 49 females, currently participating in the Narcotics Anonymous and/or Alcoholics Anonymous Program. Subjects' ages ranged from 16 to 64 with a mean of 36.98 and standard deviation of 9.14. (See Table 1.) The sample was predominantly Caucasian, $n = 104$. Of the non-White subjects, there were 7 African-Americans, 5 Hispanic, and 7 other (Table 5). The subjects' monthly income ranged from 0 to $10,000 with a mean of $2062 and a median of $1000 (Table 3). Of these subjects, 15.83% had attended some college, 43.33% had graduated from college, and 27.5% had had some graduate training (see Table 4). The subjects abstinence ranged from 3 months to 15 years (see Table 2).

Table 1.

Age Range of Subjects

Range (in years)	*N*	%
15–19	1	0.8
20–24	8	6.4
25–29	20	16.0
30–34	25	20.0
35–39	23	18.4
40–44	23	18.4
45–49	14	11.2
50–54	7	5.6
55–59	3	2.4
60–64	1	0.8

Table 2.

Time Abstinent

Range	*N*	%
3 months–1 year	9	7.2
1–2	21	16.8
2–3	22	17.6
3–4	19	15.2
4–5	10	8.0
5–6	13	10.4
6–7	13	10.4
7–8	5	4.0
8–9	5	4.0
9–10	2	1.6
10–11	1	0.8
11–12	2	1.6

Subjects were divided into five groups based on their primary drug of choice: opiates (n = 16), stimulants (a category combining cocaine and methamphetamine) (n = 21), marijuana (n = 25), alcohol (n = 26), and a polydrug group combining sedative and stimulant drugs (n = 32). Over 71% of the subjects reported growing up with one or more family members using substances, and 58.5% reported a family history of psychiatric problems. Of the subjects, 58.8% had been in jail, 35.5% had attempted suicide, 31.1% had

Table 3.

Drug of Choice and Demographics:

	Opiates			Stimulants		
	N	*M*	SD	*N*	*M*	SD
Monthly income ($)	15	1,786.67	799.88	20	1,945.00	1,059.03
Age (years)	16	39.94	9.33	21	38.14	11.32
Clean time (months)	16	50.81	41.05	21	50.55	39.64
Age first drug use (years)	16	13.88	2.68	21	13.57	4.88
First use drug of choice (years)	16	17.63	2.90	21	16.05	6.02

[a] $p < .01$.

been on psychiatric medications at some time, 9% were on psychiatric medications during the study, and 78% had been in drug treatment prior to their current treatment.

Instruments

The Eysenck Personality Questionnaire. The Eysenck Personality Questionnaire (Eysenck and Eysenck, 1975) is a 90-item self-report inventory, designed to measure three nonpathological personality dimensions: extroversion–introversion (E), neuroticism–emotional stability (N), and psychoticism–superego control (P). The Eysencks reported test/retest reliabilities for all subscales ranging from .80 to .90, and internal consistency coefficients mostly above .80.

The Zuckerman Sensation Seeking Scale. The Zuckerman Sensation Seeking Scale (SSS), Form V, measures preferred levels of stimulation and arousal, including subscales for Thrill and Adventure Seekers (TAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS) (Zuckerman, 1979). Zuckerman (1979) reports test/retest reliabilities from .70 to .94 for the subscales and internal consistency coefficients from .56 to .77 for the subscales and .84 to .85 for the total. Split-half reliabilities are between .58 and .88 for the subscales.

The Brief Symptom Inventory. The Brief Symptom Inventory is a 50-item self-report inventory that assesses psychiatric symptoms and psychopathology, including the following dimensions: Somatization, Obsessive Compulsive,

Income, Age, Clean Time, Age of First Use[a]

Marijuana			Alcohol			Polydrug			
N	*M*	SD	*N*	*M*	SD	*N*	*M*	SD	F
25	1,966.72	1,399.89	26	2,469.92	1,889.54	31	2.021.48	1,603.17	0.69
25	33.32	7.42	26	40.88	8.33	32	34.16	7.90	3.7
25	46.28	33.92	26	52.00	41.94	32	44.19	27.83	0.22
24	14.00	3.65	25	15.52	6.60	31	13.13	3.92	0.99
24	15.08	3.71	25	14.00	5.94	30	16.73	6.89	1.40

Table 4.

Drug of Choice and Demographics: Education

	Opiates		Stimulants		Marijuana		Alcohol		Polydrug	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Education										
Less than high school	1	6.25	2	9.52	2	8.70	0	0.00	0	0.00
High school	3	18.75	2	9.52	0	0.00	2	8.00	4	13.33
Some college	2	12.50	7	33.33	1	4.35	2	8.00	7	23.33
College degree	7	43.75	6	28.57	11	47.83	13	52.00	12	40.00
Some graduate study	0	0.00	3	14.29	7	30.44	4	16.00	2	6.67
Graduate degree	3	18.75	1	4.76	2	8.70	4	16.00	5	16.67

Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. Derogatis and Melisaratos (1983) report internal consistency (Cronbach's alpha) from .71 to .85 for all dimensions. Test/retest reliability ranges from .68 to .91. The authors also report good convergent, discriminant, and predictive validity.

The Biographical Information Questionnaire. This questionnaire was revised from one used in a pilot study (O'Connor and Berry, 1990), based on a questionnaire developed by Johnston and O'Malley (1986). Reliability and validity of self-report questionnaires of drug use and misuse have been discussed by O'Malley et al. (1983).

Procedure

Packets containing the three psychometric tests, a biographical questionnaire, and a letter of introduction were distributed to research assistants affili-

Table 5.

Drug of Choice and Demographics: Race

	Opiates		Stimulants		Marijuana		Alcohol		Polydrug	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
European-American	14	87.50	19	90.48	19	79.17	20	83.33	27	87.10
African-American	0	0.00	0	0	2	8.33	3	12.50	2	6.45
Latin-American	1	6.25	0	0	2	8.33	0	0	1	3.23
Other	1	6.25	2	9.52	1	4.17	1	4.17	1	3.23

ated with the N.A. Program. These contacts were asked to distribute the materials to people involved in recovery through Narcotics Anonymous.

Approximately 400 packets were distributed in early 1992 at Narcotics Anonymous meeting places familiar to the contacts. They were handed out to people who were interested in participating, after the meetings or during the meeting breaks. The contacts approached the members individually and invited them to participate anonymously in a study about "emotions and drug choice." Of the 400 packets initially given out, 150 were returned (37% response rate); of these, 5 subjects were eliminated because they had not been drug-free for three or more months, and 20 packets because they were incomplete.

RESULTS

Demographics

The drug users were classified by self-reported drug preference, although it was understood that they may have used other drugs as well. The drug preference groups did not differ from one another according to sex, education, ethnicity, or income. However, they did vary significantly in age, $F(4,115) = 3.75$, $p < .01$. Analytic comparisons (Fishers PLSD; Winer, 1971) showed that the opiate-using group had a significantly higher mean age than the marijuana and the mixed group. The alcohol-using group had a significantly higher mean age than the marijuana and polydrug group. (See Table 3.) The groups did not differ significantly from each other in time abstinent from drugs. (See Table 3.)

Major Dependent Variables

One-way analyses of variance were used to compare the drug-using groups on all subscales of the Eysenck Personality Questionnaire (see Table 6), the Brief Symptom Inventory (see Table 7), and the Zuckerman Sensation Seeking Scale, Form V (see Table 8).

The only significant overall F obtained was for the Boredom Susceptibility Subscale of the Sensation Seeking Scale. (See Table 8.) Analytic comparisons (Fishers PLSD) showed that the opiate user group had a significantly higher mean score than the marijuana and alcohol user groups, and that the polydrug group was significantly higher than the alcohol user group. These results may be confounded by age, given the significant age differences between groups reported above. A Pearson Product-Moment Correlation was calculated between age and the Boredom Susceptibility Subscale. The correlation was not statistically significant $r(113) = -.165$, $p = .069$.

Table 6.

Drug of Choice and Eysenck Personality Questionnaire

Scale	Opiates (n = 16)		Stimulants (n = 21)		Marijuana (n = 24)		Alcohol (n = 26)		Polydrug (n = 31)		F
	M	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	
Psychoticism	4.5	2.56	4.14	2.85	4.5	2.72	3.65	2.35	4.45	2.91	0.454
Extraversion	14.44	4.73	14.0	4.07	13.79	5.17	11.73	4.75	14.07	4.56	1.286
Neuroticism	14.19	6.39	14.62	5.24	13.5	5.15	13.58	4.52	13.16	5.93	0.269
Lie Scale	3.81	2.43	3.52	3.03	4.58	2.64	4.65	3.87	4.90	2.94	0.849

Table 7.

Drug of Choice and Brief Symptom Inventory[a]

	Opiates (n = 16)		Stimulants (n = 20)		Marijuana (n = 22)		Alcohol (n = 25)		Polydrug (n = 27)		
Scale	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	F
Somatization	0.58	0.464	0.60	0.692	0.45	0.633	0.60	0.553	0.51	0.525	0.292
Obsessive Compulsive	1.30	0.854	0.88	0.660	1.04	0.603	1.47	0.968	1.24	0.721	1.951
Interpersonal Sensitivity	1.48	1.395	0.95	0.719	1.33	0.944	1.32	0.903	1.19	0.890	0.813
Depression	1.20	0.923	0.62	0.621	1.02	0.944	1.09	0.832	1.07	1.004	1.257
Anxiety	1.28	1.029	1.02	0.825	0.89	0.798	1.07	0.665	0.90	0.727	0.767
Hostility	0.95	0.925	0.80	0.668	0.83	0.880	1.16	0.943	0.84	0.785	0.741
Phobic	0.65	0.818	0.36	0.438	0.44	0.500	0.54	0.468	0.43	0.537	0.775
Paranoid	1.06	0.799	0.70	0.753	0.83	0.705	0.81	0.776	0.87	0.821	0.513
Psychoticism	0.91	0.842	0.61	0.706	0.84	0.827	0.77	0.860	0.74	0.712	0.384
General Severity	1.02	0.752	0.72	0.542	0.82	0.573	0.97	0.633	0.85	0.612	0.730
Positive Symptom Total	27.94	10.47	22.50	13.48	24.09	11.30	30.36	12.55	25.74	12.72	1.429

[a] $p < .05$.

Table 8.

Drug of Choice and Sensation Seeking

Scale	Opiates (n = 16)		Stimulants (n = 21)		Marijuana (n = 24)		Alcohol (n = 26)		Polydrug (n = 31)		F
	M	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	
Thrill and Adventure Seeking	4.88	2.895	6.24	2.625	6.25	2.953	6.27	2.442	6.48	3.315	0.904
Experience Seeking	7.69	1.537	7.67	2.221	7.25	1.675	7.42	1.528	7.29	1.829	0.286
Susceptibility to Boredom	3.75	2.600	3.14	1.982	2.29	1.628	2.08	1.647	3.29	2.194	2.73*
Sensation Seeking: total	21.94	4.234	23.10	4.571	22.29	5.805	22.15	5.213	23.52	7.220	0.343

*$p < .05$.

In a preliminary analysis of the drug user groups it was noted that while not significant by individual drugs, there was a tendency for the so-called "harder" drug preference groups to be higher in extroversion than the alcohol misusing group. To further explore this, a new group was formed by combining the opiate, stimulant, and polydrug users, and compare it to the alcohol users. It was found that the alcohol group (m = 11.7, sd = 4.75) was significantly lower on Extroversion than the combined opiate, stimulant, polydrug group (m = 14.1, sd = 4.39), $F(1,92) = 5.37$, $p < .05$, and that the alcohol group (m = 2.08, sd = 1.65) was significantly lower on Susceptibility to Boredom (m = 3.35, sd = 2.21), $F(1,92) = 7.13$, $p < .01$.

There was no significant correlation between clean time and symptomatology on the BSI, or clean time and personality characteristics on the EPQ. The only significant difference on the SSS was a negative correlation between clean time and the Thrill and Adventure Seeking Subscale of the Sensation Seeking Scale, $r(120) = -.24$, $p < .05$.

Other Analyses Not Directly Related to the Hypotheses of This Study

It was found that users who reported a family history of substance misuse during their formative years (n = 83, m = 14.36, sd = 4.96) scored significantly higher on the Eysenck Neuroticism Subscale than those who reported no family substance use in those years (n = 35, m = 12.23, sd = 5.90), $F(1,116) = 4.06$, $p < .05$. Subjects with a family history of use during formative years (n = 79, m = 27.66, sd = 11.59) also scored significantly higher than those without such a history (n = 32, m = 22.16, sd = 12.34) on the Positive Symptom Total of the Brief Symptom Inventory $F(1,109) = 4.95$, $p < .05$. Subjects with a family history of drug/alcohol use during formative years (n = 85, m =0.435, sd = 0.054) also reported a significantly higher incidence of suicide attempts $F(1,118) = 9.936$, $p < .01$, and a significantly higher incidence of eating problems $F(1,119) = 8.927$, $p < .01$.

Recovering users who were in therapy during this study were compared to those who were not (see Table 9). Significant differences were found between the two groups on the following BSI scales: Interpersonal Sensitivity Subscale, Depression, General Severity, and Positive Symptom Total. On all comparisons, those who were not in therapy had lower mean scores than those who were. Other subscales approached significance (Anxiety, Hostility, Obsessive Compulsive, and Positive Symptom Distress), again with lower scores for those who were not in therapy. Those who were in therapy were also significantly higher on the Neuroticism Subscale of the EPQ. These results support research that suggests that people in therapy can appear more symptomatic (Brown, personal communication, 1991).

Table 9.

Psychotherapy, Symptomatology, and Personality

	Currently in therapy			Not currently in therapy				
	N	*M*	SD	*N*	*M*	SD	*t*	*p*
Psychoticism	40	4.16	2.90	81	4.27	2.87	0.183	.854
Neuroticism	40	15.68	4.90	81	12.99	5.42	-2.646	.009
Extraversion	40	12.48	4.79	81	13.93	4.75	1.576	.117
Lie Scale	40	3.65	1.97	81	4.82	3.48	1.964	.051
Somatization	38	0.64	0.63	76	0.53	0.55	-0.933	.352
Obsessive Compulsive	38	1.40	0.80	76	1.10	0.78	-1.927	.056
Interpersonal Sensitivity	38	1.63	0.92	76	1.07	0.96	-2.973	.003
Depression	38	1.29	1.03	76	0.88	0.80	-2.385	.018
Anxiety	38	1.22	0.78	76	0.94	0.79	-1.826	.070
Hostility	38	1.12	0.80	76	0.81	0.83	-1.857	.065
Phobic	38	0.55	0.48	76	0.42	0.55	-1.264	.208
Boredom Susceptibility	40	2.85	1.78	81	2.83	2.13	-0.058	.953
Paranoid	38	0.97	0.80	76	0.79	0.74	-1.228	.221
Psychoticism	38	0.94	0.82	76	0.68	0.77	-1.657	.100
General Severity	38	1.07	0.61	76	0.79	0.61	-2.32	.02
Positive Symptom Distress	38	1.74	0.52	76	1.56	0.54	-1.76	.080
Positive Symptom Total	38	30.16	10.28	76	24.43	12.58	-2.426	.016

DISCUSSION

The results of this study suggest that drug preference is not related to differences between users in regard to psychopathology. The self-medicating theory of drug overuse (Bell and Khantzian, 1991) was not supported by this current study, which found no difference between users who preferred different specific drugs, in a standardized measures of psychopathology, nor in measures of broad nonpathological personality traits. One finding, however, suggested that opiate users may be more susceptible to boredom.

When alcohol misusers were compared to users who preferred what are considered "harder drugs" (and what are in the United States, illegal substances), it was found the alcohol misusers were significantly lower in Extroversion. The tendency of those who prefer the illegal drugs to be higher in Extroversion and Susceptibility to Boredom suggests the usefulness of exam-

ining drug preference in terms of broader social categories. Possibly, the higher number of subjects derived from the combined groups led to the significant difference found in Extroversion, and that a study with a larger sample might find this difference when comparing specific drug groups.

The lack of relationship between symptomatology and time abstinent from drugs suggests that users in recovery continue to deal with psychological problems and may explain why 64% of this sample participated in psychotherapy at some point while in recovery, and why 33.06% are currently in psychotherapy process. This lack of correlation between clean time and symptomatology differs from the findings reported by DeSoto et al. (1985). The present study suggests that individuals across drug user groups who grew up in homes with substance misuse problems exhibit elevation in some measures of psychological problems. It was also found that former users currently in psychotherapy had more severe symptomatology. Brown (1985) found that increased psychiatric symptomatology was expected and normal in recovery, and may be particularly elevated in this sample because of the number currently in psychotherapy.

Subjects in this study were from a specific 12-Step self-help recovery program and may not be representative of the substance using population as a whole; people who choose to recover in this type of program may differ from others. Furthermore, participation in a 12-Step program may provide a treatment effect that leads to a similarity in the members.

Another methodological concern is the low rate of return of these measures; possibly the subjects in this study represent a particular subgroup of users within this particular recovery program. The education of these subjects was higher than that expected from groups with substance misuse problems. Possibly these subjects were, for unknown reasons, more interested in taking part in such an endeavor, or perhaps they were more compliant in personality or social behavior. In order to confirm these results, a replication study using different collection methods and including a larger and more diverse sample may be useful.

REFERENCES

BABOR, T. F., ORROK, B., LIEBOWITZ, N., SALOMON, R., and BROWN, J. (1990). From basic concepts to clinical reality: Unresolved issues in the diagnosis of dependence. In M. Galanter (Ed.), *Alcoholism: Vol. 8. Combined Alcohol and Other Drug Dependence* (Publication of the American Society of Addiction Medicine and the Research Society on Alcoholism). New York: Plenum Press.

BELL, C. M., and KHANTZIAN, E. J. (1991). Contemporary psychodynamic perspectives and the disease concept of addiction: Complementary or competing models? *Psychiatr. Ann.* 21(5).

BROWN, S. (1977). *Defining a Continuum of Recovery in Alcoholism.* Unpublished doctoral dissertation, California School of Professional Psychology, Berkeley, California.

BROWN, S. (1985). *Treating the Alcoholic*. New York: Wiley.

CARROL, E. N., and ZUCKERMAN, M. (1977). Psychopathology and sensation seeking in "downers," "speeders," and "trippers:" A study of the relationship between personality and drug choice. *Int. J. Addict.* 12(4): 591–601.

DEROGATIS, L. R., and MELISARATOS, N. (1983). The brief symptom inventory: An introductory report. *Psychol. Med.* 13: 595–605.

DESOTO, C. B., O'DONNELL, W. E., ALLRED, L. J., and LOPES, C. E. (1985). Symptomatology in alcoholic at various stages of abstinence. *Alcoholism: Clin. Exp. Res.* 9(6): 505–512.

EYSENCK, H. J., and EYSENCK, S. B. G. (1975). *Manual: Eysenck Personality Questionnaire (junior and adult)*. San Diego, California: EdITS/Educational and Industrial Testing Service.

GALIZIO, M., and STEIN, F. S. (1983). Sensation seeking and drug choice. *Int. J. Addict.* 18(8): 1039–1048.

HEATH, D. (1990). Cultural factors in the choice of drugs. In M. Galanter (Ed.), *Alcoholism: Vol. 8. Combined Alcohol and Other Drug Dependence*. New York: Plenum Press.

HENRIQUES, E., ARSENIAN, J., CUTTER, H., and SAMARAWEERA, A. B. (1972). Personality characteristics and drug of choice. *Int. J. Addict.* 7(1): 73–76.

INABA, D. S., and COHEN, W. E. (1989). *Uppers, Downers, All Arounders*. San Francisco: Clinemed Inc. and Biomed Arts Association.

JOHNSTON, L. D., and O'MALLEY, P. M., (1986). Why do the nation's students use drugs and alcohol? Self-reasons from nine national surveys. *J. Drug Issues* 16(1): 29–66.

KHANTZIAN, E. J. (1985). The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *Am. J. Psychiatry* 142(11): 1259–1264.

McLELLAN, A. T., WOODY, G. E., and O'BRIEN, C. P. (1979). Development of psychiatric illness in drug abusers: Possible role of drug preference. *New Engl. J. Med.* 301(24): 1310–1314.

MILKMAN, H., and FROSCH, W. A. (1973). On the preferential abuse of heroin and amphetamine. *J. Nerv. Ment. Dis.* 156(4): 242–248.

MIRIN, S. M., WEISS, R., and MICHAEL, J. (1988). Psychopathology in substance abusers: Diagnosis and treatment. *Am. J. Drug Alcohol Abuse* 14(2): 139–157.

O'CONNOR, L., and BERRY, J. (1990). The drug-of-choice phenomenon: Why addicts begin using their preferred drug. *J. Psychoactive Drugs* 22(3): 305–311.

O'CONNOR, L., BERRY, J., MORRISON, A., and BROWN, S. (1992). Retrospective report of psychiatric symptoms before, during, and after drug use in a recovering population. *J. Psychoactive Drugs* 24(1): 65–68.

O'MALLEY, P. M., BACHMAN, J. G., and JOHNSTON, L. D. (1983). Reliability and consistency in self-reports of drug use. *Int. J. Addict.* 18(6): 805–824.

PITTEL, S. (1971). Psychological aspects of heroin and other drug dependence. *J. Psychedelic Drugs* 4(1): 40–45.

ROSENTHAL, T. L., EDWARDS, N. B., ACKERMAN, B. J., KNOTT, D. H., and ROSENTHAL, R. H. (1990). Substance abuse patterns reveal contrasting personal traits. *J. Substance Abuse* 2: 255–263.

VAILLANT, G. (1981). Dangers of psychotherapy in the treatment of alcoholism. In M. H. Bean and N. E. Zinberg (Eds.), *Dynamic Approaches to the Understanding and Treatment of Alcoholism*. New York: Free Press, pp. 55–96.

VERINIS, J. S., WETZEL, L., VANDERPORTEN, A., and LEWIS, D. (1986). Improvement in men inpatients in an alcoholism rehabilitation unit: A week-by-week comparison. *J. Stud. Alcohol* 47(12): 85–88.

WINER, B. J. (1971). *Statistical Principles in Experimental Design*. New York: McGraw-Hill.

ZUCKERMAN, M. (1979). *Sensation Seeking: Beyond the Optimal Level of Arousal*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

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