Personality, Drug Abuse and Murder:
A Pilot Study

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Some people can use psychoactive drugs recreationally with little lasting harm, but for others such use turns to chronic abuse and ultimately to neurotoxic states that both resemble and exacerbate preexisting mental illness.

Abstract

Mentally ill drug abusers are over-represented in the incarcerated criminal offender population and account for a significant proportion of violent crimes, including homicide. The present pilot study sought to correlate patterns of association between personality factors and choice of crime-associated drugs of abuse in a cohort of fifty-five drug-abusing male murderers studied months and years after withdrawal of their drugs. Preliminary indications suggest that hallucinogen and stimulant abusers are discriminable by their personality factor responses, and stimulant abusers (cocaine and amphetamines) are statistically distinguished from the group as a whole in possessing more paranoid and schizotypal patterns of responding. These preliminary findings may be relevant to public health strategy and to considerations of criminal culpability, policing and corrections.

Key Words:

Personality tests,16-PF, drugs of abuse, murder

The behaviors emerging from such psychotoxic states are frequently anti-social and often violent, sometimes murderously so. It is not surprising therefore that both the mentally ill and the chronic drug abuser populations, including individuals who are counted in both groups, are disproportionately represented among criminal offenders in the jails and prisons.

Notwithstanding recent reductions in overall crime rates, the problem of drug-induced criminal violence is becoming proportionately worse. In the 1997 survey of inmates in state and federal correctional facilities, over 570,000 of the nation's 1,134,723 prisoners reported the use of alcohol or drugs while committing their offense. Of those arrested specifically for murder, 51.9 percent of State prisoners and 39.8 percent of Federal prisoners admitted to the use of alcohol or drugs at the time of the offense (Mumola, 1999). At midyear 1998 an estimated 283,000 mentally ill offenders were incarcerated in the nation's prisons and jails. In recent surveys, 16 percent of State prison inmates, 7 percent of federal inmates and 16 percent of those in local jails reported either a mental illness or an overnight stay in a mental hospital. Among probationers, about 16 percent, an estimated 547,800 people, admitted to either inpatient hospitalization or to having a mental illness at some point in their lifetime (Ditton, 1999). Further, state prison inmates with a mental condition were more likely than other inmates to be incarcerated for a violent offense (53 percent compared to 46 percent), more likely to be under the influence of alcohol or drugs at the time of the current offense (59 percent compared with 51 percent) and more than twice as likely as other inmates to have been homeless in the 12 months prior to their arrest (20 percent compared with 9 percent). At the time of the survey in mid 1998, over three quarters of *mentally ill* inmates had been sentenced to time in prison or jail or probation at least once prior to their current sentence. Therefore the mentally ill comprise the largest subpopulation of recidivists, repeat offenders, and the most problematic of these are the drug abusing mentally ill.

Although such incidence statistics cannot provide evidence of causality, it is a common clinical observation that substance abuse both contributes to the development of mental illness and exacerbates its behavioral expression and the two become inextricably entwined in attempts to understand criminal behavior, including criminal violence and homicide. Considerable research has been devoted to examining the inter-relations of specific mental illness diagnoses and substances of abuse (*see, for example*: Lipman 1997; Artigues, et al., 1996; Denisen, et al., 1997; Links, et al., 1995), but problems abound, due, in part, to the nosological upheaval caused by shifting diagnostic boundaries. Last decade's psychotic disorder is this decade's personality disorder or affective illness (see, for example, Kutchins & Kirk, 1997). Relatively constant throughout this period of upheaval, however, are the psychometric measures indexed by established personality measuring instruments such as the Minnesota Multiphasic Personality Inventory (MMPI), the Millon, and the 16-Personality Factors (16-PF). Much can be gained in

returning to the roots of the questions that surround drug choice, personality traits and violent criminal misbehavior, to examine trait associations of drug choices.

Most studies of personality variables in offender populations have employed the MMPI as the objective instrument of assessment. However, in one of the largest and most often cited studies of a general inmate sample, Megargee, et al., (1979) found that the largest of their ten typologies of offenders by MMPI criteria had essentially normal profiles. In yet other reports, MMPI indices have not been found useful in discriminating between different violent offender subgroups (Holland, Beckett & Levi, 1981) or in distinguishing those who sexually assaulted children (Hall, et al., 1986) and Quinsey, et al., (1980) found the MMPI profile to be unrelated to offense category. As has been observed by Tammany, Evans and Barnett (1990), it seems that while the MMPI is useful in identifying the presence of severe pathology, such pathology is not present in most inmates. Tammany, et al. have suggested therefore that research of this type should use objective measures of normal-range personality rather than of significant psychopathology and have commended the 16-PF for this purpose. Their method sought to identify which 16-PF features might differentiate one type of offender from another. The present study builds upon Tammany's work, among a single class of offenders – drug abusers convicted of murder – and sought to identify associations of personality traits as measured by the 16-PF and the drugs abused at the time of the crime.

Methods

Subjects: The cohort comprised 55 male subjects ultimately adjudicated guilty of murder who were subjected to clinical interview as part of a forensic neuropharmacological assessment either before or after their trial. All were pre-selected for inclusion by positive drug abuse history both during and prior to the criminal offense. All subjects were incarcerated and drug free at the time of assessment and had been so for at least five months to a maximum of six years. All gave written consent to their information being anonymously reported for research purposes. As part of the research protocol, each was administered the Clinical Analysis Questionnaire (CAQ, Krug & Cattell, 1980; Catell, 1989), a factor-analytically derived psychometric personality assessment method, under standard conditions and the presently reported 16 PF portion of the CAQ was scored using norms published by IPAT in 1989 (Male, Form A, General Population, based on age 30 years, n=2556). The 16-PF allows the subject personality to be quantified in terms of 16 "normal personality" constructs or domains, termed "Factors." The names and abbreviations of each of these 16 personality factors are given in Fig 1. The method has inherent validity testing subroutines that measure and compensate for subject bias in responding. During the course of the clinical interview - or following this and based on the subject's responses - a modified form of the Addiction Severity Index Interview was administered to capture lifetime drug use and drug use at the time of the offense responsible for their present classification.

The present findings reported here concern only the 16-PF portion of the test, relating as these do to "normal" personality factors. On the collated database, Pearson Product-Moment Correlation Analysis was performed using SPSS version 9. Pearson Correlation coefficients (r) were calculated for 16-PF factor scores in each drug abuse category. Few subjects employed only one drug, so that the data of individual subjects were entered into the correlation analysis for the category of each drug involved at the time of their crime.

Results

As a consequence of the categorical approach to analyzing this data set, the sample sizes within each drug category were necessarily small. This increases the likelihood that the results capitalized on chance. For this reason, these results should be viewed as preliminary findings.

Subject demographics and drug use patterns are summarized in **Table 1**. Their ages ranged between 17 and 52 years (mean ± SD = 32.2 ± 8.5). Individuals were assigned to the appropriate

Subject#	Age	Principle Lifetime Drug(s)	Crime-Associated Drug
1	39	Crack	Crack
2	23	Alc, MJ, Cocaine	Alc, MJ, Cocaine
3	35	Alc, crack cocaine	Crack
4	45	Amphetamine, alc, MJ	Speed, alc
5	31	Alc, cocaine	Crack
6	26	PCP, MJ, Alc	PCP, alc, MJ
7	46	Alc, amphetamine, quaalude, LSD, cocaine	LSD, alc, Cocaine, Quaalude
8	32	Alc, quaaludes, cocaine	Alc
9	29	Alc, MJ, methamphetamine, dilaudid	Methamphetamine, valium, alc,
10	33	Meth, preludin, alc, tuinal, heroin, LSD, desoxyn	Methamphetamine
11	36	Methamphetamine, LSD, PCP, cocaine, alc	Methamphetamine
12	34	Alc, MJ, speed, LSD, crack	Crack, alc
13	45	Alc, ritalin, amphetamine, preludin, crack	Alc, crack
14	43	Alc	Alc
15	27	MJ, alc, amphetamine, cocaine, psylocybe	Methamphetamine, alc
16	44	Alc	Alc
17	29	Alc, MJ, cocaine, dalmane	Cocaine
18	23	Alc, MJ	Crack
19	32	Alc, MJ, LSD, amphet., cocaine, mescaline, methaqualone	LSD, alc
20	25	MJ, alc, LSD, cocaine	Alc, cocaine
21	37	Alc, amphetamine, MJ, mescaline, dilaudid, mandrax	Alc, Mandrax
22	29	MJ, alc, LSD, cocaine	Alc, cocaine, valium
23	41	Alc, cocaine, methamphetamine	Cocaine, alc, doxylamine
24	41	Methamphetamine, crank	Alc, doxylamine
25	52	Alc, opiates, Quaalude, MJ, cocaine, phenobarbitone	Tuinal, percodan, valium, alc
26	36	Amphetamine, MJ, PCP, LSD, cocaine, heroine	Cocaine, alc
27	37	MJ, LSD, Alc, cocaine, Quaalude, valium, Dilaudid	Dilaudid, alc
28	28	MJ, Cocaine, Valium, Alc	Cocaine
29	31	MJ, alc, Crack	Cocaine
30	17	MJ, alc, methamphetamine, valium, sinequan	MJ, alc, diazepam
31	41	Alc, amphetamine,Quaalude	Amphetamine, Quaalude
32	36	Alc, preludin, benzedrine, LSD, Ritalin	Alc
33	20	Alc, MJ, LSD, mushrooms, cocaine	LSD, cocaine, morphine
34	29	PCP	PCP
35	26	Alc, MJ, LSD, Cocaine, Heroin	Cocaine
36	20	MJ, LSD	LSD
37	24	Heroin, cocaine, methamphetamine, alcohol	Cocaine
38	47	Amphetamine, cocaine	Amphetamine
39	31	Crack, alcohol	Crack, alcohol
40	19	MJ, alc, Cocaine, rohypnol	Alc, Cocaine
41	35	LSD, heroin	LSD, heroin, amphetamine
42	32	LSD, Alc	Alc
43	30	Methamphetamine, cocaine	LSD, methamphetamine
44	40	PCP, alc, Quaalude	Alc
45	37	Alc, methamphetamine	Methamphetamine
46	19	Inhalants, mushrooms, MJ, ,LSD,alc,PCP,coke,meth	Cocaine, LSD
47	23	Alc, MJ, ecstasy (MDMA), LSD, Amphetamine, rohypnol	Alc, rohypol, ecstasy (MDMA)
48	18	Alc, cocaine, MJ	Crack, cocaine, alc
49	37	Cocaine, heroin, alc, MJ	Halcyon, Xanax, cocaine
50	16	Alc, amphetamine, MJ, methamphetamine,	Methamphetamine, amphetamine
51	46	Alcohol	Demerol, Talwin, Flexeril
52	30	MJ,speed,alc,LSD, PCP, cocaine,dilaudid,heroin,	Alc
53	26	MJ, LSD, cocaine, methamphetamine	Methamphetamine
54	33	MJ, crack, alc,	Alc, crack
55	34	Alc, methamphetamine, cocaine, valium, Xanax	Alc, methamphetamine, benzos

TABLE 1: Age and drug choice amongst 55 convicted murderers (KEY: meth = crank = methamphetamine; MJ = marijuana alc = ethanol (alcohol); speed = amphet = amphetamine; mushrooms = psilocybe; crack = cocaine base; benzos = benzodiazepines; inj = intravenous injection; coke = cocaine salt; mandrax=quaalude=methaqualone)

Table 2: Drug classification system used in the present study

CLASS	n	DRUG
Alcohol	31	Ethanol (beverages, beers, wines and spirits)
Opiates	5	Morphine, heroin, dilaudid (hydromorphone), Demerol (meperidine) Talwin (pentazocine), Percodan (oxycodone)
Stimulants	37	Methamphetamine, amphetamine, Preludin (phenmetrazine), Ritalin (methylphenidate), cocaine [both hydrochloride and base ('crack')]
Depressants	13	Benzodiazepines including Xanax (alprazolam), Valium (diazepam), Rohypnol (flunitrazepam), Dalmane (flurazepam), Halcion (triazolam), Flexeril (cyclobenzaprine), doxylamine, methaqualone (includes Quaalude and Mandrax,), Tuinal and other barbiturates
Hallucinogens	10	LSD, Phencyclidine (PCP, 'Angel Dust'), Psilocybin ('mushrooms'), MDMA ('ecstasy')
Marijuana	3	Cannabis leaf and resin (hashish)

category of pharmacological classification, as illustrated in **Table 2** categorized by the offense-associated drug. Clearly stimulants and alcohol were over represented in this cohort and opiates and marijuana under-represented. The statistical power of the smaller groups to define their drug category association is of course very limited, as is also true of the largest groups. Pearson product-moment analysis of the 16-PF scores of each drug category yielded the statistical results shown in **Table 3**, with group means illustrated in **Fig 1**.

16-PF scores on each factor are normalized by a "Standard Ten" (or "Sten") transformation, having an average distribution centered on 5.5 ± 2.0. With certain notable exceptions, as described below, the overall patterns of responding on the 16-PF subscales were remarkably similar across all drug abuser categories (see Fig. 1 and Table 3). The cohort as a whole scored in the low normal range (Sten 4.34) on Factor "A" (warmth), which measures the subject's emotional orientation to other people. Stimulant and marijuana users scored highest in this range, although this difference was not statistically significant (p=0.219, stimulants; p=0.785, marijuana). Factor "A" is notable on this instrument as having the greatest influence on personality structure, making the largest contribution to the assessment of personality of all the factors of the 16-PF, identifying the subject's attitude toward social interaction and the value of others to the individual's well being (Cattell, 1989)

The cohort's average response in the "Intelligence" scale Factor "B" was likewise in the low normal range, which on the 16-PF roughly corresponds to the "normal" range of intelligence (100 ± 15) as measured by culture fair tests. The 16-PF's Factor "B," however, does not directly measure full-scale intelligence, but rather the degree of abstract versus concrete thinking style, which has some correspondence to other measures of intelligence, particularly around the normal range and above.

The group as a whole scored lower than normal (Sten 3.93) on Factor "C" (emotional stability), but this again did not reach statistical significance for any of the drug user categories. Factor C measures ego strength, with lower scores indicating emotional immaturity, emotionality when frustrated, evasiveness of responsibilities and an easily perturbed style of thought and feeling.

Factor "E" scores for the group as a whole were also in the normal range (Sten 5.27) on this axis which measures "dominance." This scale measures the submissive vs. assertive and the dependent vs. independent mindedness of the subject. Unconventional and rebellious types typically score high on Factor "E," whereas considerate and diplomatic types typically score low. This drug abusing murderer cohort scored in the normal range, however. Although the marijuana users scored higher than average on this axis, it is likely that the higher mean score is a statistical artifact of the small sample.

Factor "F" Sten scores for the group as a whole were unremarkable (Sten 5.04) on this axis which measures "impulsiveness." Marijuana users scored lowest (4.0 ± 1.73) and depressant users scored highest (6.0 ± 2.27) but the statistical significance of their correlation coefficient (p=0.417 and p=0.096 respectively) did not breach the 0.05 level.

On the "Conformity" axis of Factor "G," hallucinogen users' Sten scores were negatively correlated (Pearson correlation coefficient was –0.268 at a significance level of 0.046), indicating that their low score on this axis was likely to be representative of the larger population of hallucinogen abusing murderers. Factor "G" measures characteristics of superego strength. Low scoring individuals, such as the hallucinogen abusers, disregard rules, are described as expedient, fickle, frivolous and self-indulgent. They disregard obligations to other people and are unconcerned about moral standards and rules. They may not necessarily be amoral, but their superego systems are not aligned with conventional standards.

The group scored low (Sten 3.7) on Factor "H" (boldness), suggesting passive adaptation to environmental demands, as might be appropriate to a prisoner. The group as a whole scored high (Sten 7.35) on Factor "I" (sensitivity), yet notwithstanding this group elevation, the hallucinogen abusers scored very significantly higher still (Sten 8.60, r = 0.357, p=0.007). Such individuals are typically insecure, anxious and emotionally oversensitive. When high "I" scores coexist with low "C" scores, as is seen in the cohort generally, the combination is correlated with high degrees of subjective stress.

Factor "L" (suspiciousness) Sten scores for the group as a whole were in the normal range (Sten 6.2), with opiate users and stimulant users scoring higher than the group mean. Only the scores of stimulant abusers were significantly positively correlated, however (r= 0.323, p = 0.015), suggesting that a history of stimulant abuse in murderers is most likely to be associated with a high score on factor "L." This factor is one of the few within the 16-PF profile in which high scoring has no redeeming qualities. High scores are associated with dogmatism, jealousy, suspiciousness and irritability. The interpersonal styles of high "L" individuals are

CRIME - ASSOCIATED DRUG

16-PF FACTOR		DEPRESSANTS	OPIATES	STIMULANTS	ALCOHOL	HALLUCINOGEN	MARIJUANA
	r	-0.099	0.004	0.226	-0.167	-0.044	0.37
WARMTH (A)	sig	0.472	0.975	0.094	0.219	0.748	0.785
	r	0.126	-0.11	-0.9	-0.062	-0.113	-0.093
INTELLIGENCE (B)	sig	0.358	0.418	0.507	0.65	0.408	0.497
EMOTIONAL	r	0.146	-0.046	-0.008	0.017	0.156	-0.069
STABILITY (C)	sig	0.288	0.736	0.956	0.902	0.252	0.614
	r	0.061	0.016	0.188	-0.097	-0.128	0.138
DOMINANCE (E)	sig	0.660	0.906	0.164	0.478	0.346	0.309
	r	0.226	-0.01	0.071	-0.144	0.046	-0.111
IMPULSIVITY (F)	sig	0.096	0.943	0.602	0.291	0.735	0.417
	r	-0.075	-0.064	0.064	-0.157	-0.268	-0.032
CONFORMITY (G)	sig	0.587	0.638	0.642	0.249	0.046	0.814
	r	-0.204	-0.082	0.181	-0.166	0.095	-0.07
BOLDNESS (H)	sig	0.136	0.546	0.181	0.223	0.488	0.608
	r	-0.008	-0.06	0.101	0.39	0.357	-0.02
SENSITIVITY (I)	sig	0.952	0.66	0.457	0.778	0.007	0.882
	r	0.003	0.118	0.323	-0.238	-0.11	0.028
SUSPICIOUSNESS (L)	sig	0.985	0.387	0.015	0.078	0.418	0.84
	r	0.043	-0.09	0.014	0.193	-0.134	-0.319
IMAGINATION (M)	sig	0.758	0.508	0.917	0.153	0.323	0.017
	r	-0.132	-0.039	-0.154	-0.013	0.104	-0.069
SHREWDNESS (N)	sig	0.335	0.777	0.257	0.922	0.446	0.615
	r	0.020	0.024	0.295	0.032	-0.38	0.108
INSECURITY (O)	sig	0.884	0.86	0.027	-0.815	0.004	0.429
	r	-0.013	0.155	0.183	-0.059	0.14	0.18
RADICALISM (Q1)	sig	0.923	0.254	0.178	0.667	0.305	0.185
	r	0.229	0.13	-0.254	0.055	0.14	0.009
SELF SUFFICIENCY (Q2)	sig	0.027	0.341	0.059	0.688	0.302	0.949
	r	0.036	0.023	-0.268	0.064	0.038	-0.065
SELF DISCIPLINE (Q3)	sig	0.792	0.865	0.046	0.641	0.781	0.637
	r	0.068	0.043	0.087	0.006	-0.27	0.014
TENSION (Q4)	sig	0.624	0.755	0.525	0.964	0.044	0.921

Table 3: Pearson product-moment correlation coefficients (r) and their statistical significance (p, sig) for each drug class and each 16-PF Factor. p values<0.05 are indicated by boxes.

dominated by defensive projection. High scoring individuals tend to be paranoid, hypervigilant, stress-prone and when combined with high "O" scores, as the group was in the present case (see below) they are often considered poor candidates for successful treatment.

Factor "M" (imagination) Sten scores were low for the group as a whole (Sten 3.34), but only in the small subgroup of marijuana users was a significant negative correlation associated uniquely with the group (Sten 1.67 ± 0.58, r = –0.319, p =0.017), implying that lower "M" scores are most likely to be found in a larger group of marijuana-abusing murderers than in those abusing other drugs. Low scoring individuals on this axis are typically described as conventional, unimaginative, practical individuals, guided by objective realities, valuing the concrete and sensately obvious, preferring the familiar and predictable and having difficulties in organizing patterns of facts to grasp their inter-relational meaning.

Marijuana users also scored somewhat lower than the group as a whole on Factor "N" (shrewdness), but this was not statistically significant and the cohort's mean response on Factor "N" was in the average range (Sten 6.06). Mean responses of this murderer cohort on Factor "O" (insecurity) were elevated (Sten 7.03), with hallucinogen abusers' scores less elevated and marijuana abusers more elevated and negatively correlated than the group mean (though not significantly so). In contrast, the larger sample of stimulant abusers' high-scoring responses (Sten 7.49) was both significantly and positively correlated (r= 0.295, p = 0.027) within Factor "O." This factor measures the degree of "guilt proneness" of the individual, with low scoring individuals (hallucinogen abusers) endors-

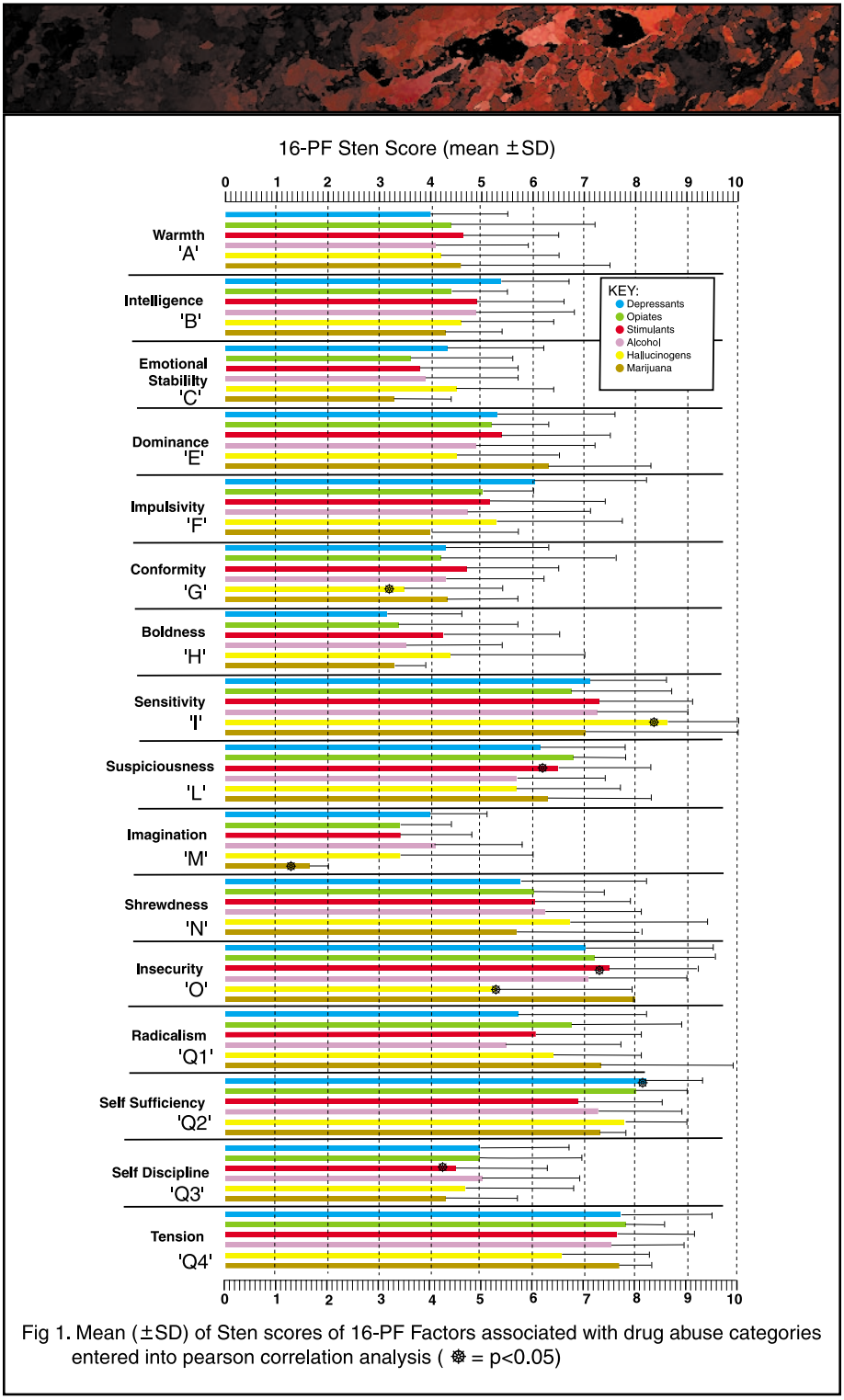


Fig 1. Mean (±SD) of Sten scores of 16-PF Factors associated with drug abuse categories entered into pearson correlation analysis (☸ = p<0.05)

ing more self-confidence, cheerful resilience and insensitivity to other's approval or disapproval and high scoring individuals (stimulant abusers) tending toward phobic symptoms, being readily overcome by moods and being over-sensitive to other's opinions and suffering pervasive shame, self doubt and low self esteem.

Scores on the "radicalism" axis of Factor "Q1" were likewise slightly though not statistically elevated for the murderer cohort, and this elevation was also apparent (Sten 7.61) on Factor "Q2" (self-sufficiency), though Pearson correlation coefficients were significant only for the depressants category of drug abusers (p=0.027, r =0.229). The negative correlation (r = -0.254) of the stimulant abusers on Factor "Q2" very closely approached significance (p=0.059) and would appear to be clinically relevant. Factor "Q2" measures the dimension bounded on the low side by group dependency and on the high scoring aspect by self-sufficiency and group independence. High scoring individuals typically report that although they are often alone they are never lonely. They are self-sustaining and are not needful of reassurance.

Among Factor "Q3" scores, only the stimulant abusers' negative correlation reached the level of significance (r= –0.268, p=0.046, Sten 4.49). The construct of Factor "Q3" has, as its low scoring description, characteristics of low will power and either a lack of ordinary concern for maintaining a socially-approved self-image or a failure of the individual to achieve a workable set of personal ideals upon which to pattern their behavior. It is over represented in the group profile of survivors of attempted suicide, according to Cattell (1989).

Finally, for the cohort as a whole, Factor "Q4" scores (tension) were elevated across all drug abuser groups (mean Sten 7.52), with no particular drug abuse category showing significant Pearson correlation coefficients.

Conclusions

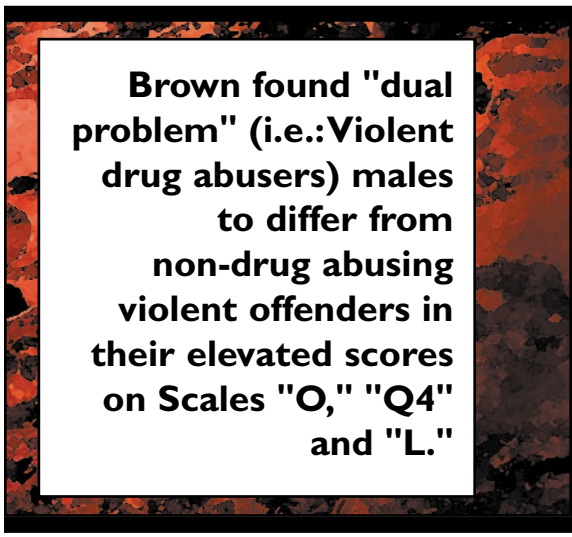
Hallucinogen abusers and stimulant abusers demonstrated unique characteristics in this group of drug abusing murderers and the stimulant subgroup was most distinct. Stimulant abusers correlated positively on Factor "L" and Factor "O" and negatively on Factor "Q3" and approached significance on their negative correlation on Factor "Q2". As with all cross-sectional studies, and in contrast to prospective or longitudinal efforts, it is technically impossible to conclude that the drug abuse history is etiologically responsible for the effects measured. An alternative explanation is that persons with these trait characteristics had in the past been drawn to this type of substance abuse. Correlations do not prove causality, yet the simplest explanation is the former.

Thus, the finding that psychostimulant abusers, tested months and years after they had abandoned their drug abuse due to arrest, were discriminable from other violent criminals in retaining paranoid and schizotypal patterns of responding in their 16-PF testing, is strongly supportive of the hypothesis that this drug abuse typology results in paranoid personality trait structure. The existence of enduring neurotoxicity in psychostimulant abusers has been suggested before by others, but not specifically in murderers as a class. Satell and Edell (1991), employing the Perceptual Aberration Scale and the Mag-

ical Ideation Scale, both developed by Chapman, et al. (1978, 1983), found that high combined scores on these instruments, which measure unusual thinking, correlated well with a history of having experienced paranoid psychotic reactions to cocaine abuse. The phenomenon of limbic system sensitization – rather than tolerance – to repetitive administration of psychostimulant drugs has been studied by a number of authors and was originally described by Post & Kopanda (1976) as a "kindling" phenomenon common to both amphetamines and cocaine. This enduring pro-psychotic effect has been measured not only in man, where it was early described as a facilitated "reactivation of paranoia" on subsequent drug administration (Kramer, 1972), but also in laboratory models of this condition in the rat, dog, monkey and guinea pig (see Post & Kopanda for review). The chronic stimulant-evoked condition is but one aspect of a wider seizure-related phenomenon that has been termed "limbic ictus," affecting as it does the limbic and temporal circuits within the brain. It has been suggested that this syndrome is responsible for the atypical psychoses therapeutically responsive to anticonvulsant / antiepileptic drugs such as carbamazepine (Monroe, 1982) and valproate. Recent studies performed using proton magnetic resonance to detect long-term metabolite abnormalities in the brain shed light on these findings. Comparing long-term (several months) abstinent chronic methamphetamine abusers to normal volunteers, Ernst and Chang (2000) find persistent reduction in the concentration of N-acetylaspartate (NA) in various brain areas. Particularly relevant to the present findings are their demonstration of an inverse logarithmic relationship between frontal white matter NA and the users' intensity of methamphetamine abuse, an index of neuronal loss in brain areas important in subserving some of the unique personality trait attributes (the frontal lobes and their temporal lobe connections) in the stimulant abuser group of the present study. This group's earlier report (Chang, et al., 1999) of related findings in the brains of abstinent cocaine abusers and their observation that this is accompanied by glial activation (measured by increased myoinositol), provides a basis for the common behavioral psychotoxicity induced by both cocaine and the amphetamines – and as reflected in the present findings in terms of enduring personality measures. Most interestingly, Chang, et al. found a gender difference in this neurotoxicity due to cocaine (females being less brain damaged), which could not be examined in the present all-male cohort. Future work must include an examination of such gender distinctions in personality trait structure associated with drug abuse history.

Several caveats must be applied to the design of this study and to the interpretations drawn from the 16-PF, which it employed. The population was entirely of incarcerated individuals and it is inevitable that the state of incarceration will alter the world view and response style of the subject. This is particularly the case with Factor "E," for instance, since "dominance" and "submissiveness" are roles as well as traits and are expected to undergo state-dependant change under conditions of incarceration. Likewise Factor "H," in which the influence of institutionalization may be to reduce scores and reflect a degree of unpleasant affect and withdrawal congruent with the imprisoned condition, and Factor "O," which can be influenced by state conditions (Cattell, 1989). However, such influences as the incarcerated condition imposed were in principal common to the group as a whole, so that unlike studies which seek to compare the imprisoned with the free, these influences reasonably applied to all cohort members equally. The option exists, with the 16-PF, to apply "prisoner" norms, developed originally by Eber (1975) from a cohort of 3323 inmates, but the election in the present work to use "normal male" norms followed from our desire to examine these drug-trait associations in the wider context of the normal population of which our cohort was a part until arrested, rather than comparing our cohort to other prisoners whom they joined.

A major limitation of the present study, which follows from the small number of individuals in the cohort, is the small and unequal sizes of the individual drug abuser categories. A related problem pendant from the small subgroup numbers is that the influence of drug combinations could not be statistically assessed. A further limitation arises from the inability (again on group-size grounds) to take into account the varied drug-using backgrounds of the subgroup members where these are categorized on the basis of the crime-associated drugs. With these caveats understood, however, the present cross-sectional survey approach does yield some interesting findings, particularly with regard to the larger subgroups and most specifically with regard to the stimulant abusers.



The recent work of Brown, et al. (1999), comparing drug-abusing and drug-free domestic violence offenders provides some context in which our findings can be considered. Brown found "dual problem" (i.e.: Violent drug abusers) males to differ from non-drug abusing violent offenders in their elevated scores on Scales "O," "Q4" and "L." The mean scores of our cohort of drug abusing murderers were similarly elevated on these three Factors, yet Brown, et al. did not find Factor "I" elevated and we did, particularly among hallucinogen abusers. In addition, Brown did not find a significant elevation on Factor "Q2," as was our finding, particularly among depressant abusers. There are considerable differences between our murderers and Brown's more thorough psychological study of domestic batterers attending therapy, not least being the greater severity of both drug abuse and vio-

lence intensity in our own subject sample. The much larger study by Tammany, et al. (1990) on 766 male felony offenders in Kansas, however, found no discrimination among 16-PF scale scores distinguishing violent from non-violent offenders. Unfortunately, the particular populations they worked with and the method used to categorize their crimes (against persons or against property or drug offenses or "indecent liberties"), did not distinguish substance abusing violent from non-violent offenders and in fact, the substance abuse level was similar for both person and property crimes subgroups. Thus, their failure to distinguish a "violence effect" may have been an artifact of their categorization procedure.

The present survey is a work in progress and, although quite preliminary, it provides some intriguing first indications concerning associations between historic drug abuse and enduring psychological traits. Future work in this expanding population coupled with a larger sampling of non-murder assault offenders will address the influence of drug combinations and will particularly test hypotheses regarding combinations of factors that influence proclivity to, and expression of, violence.

About the Author

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