

Amphetamine Psychosis:

I. Description of the Individuals and Process¹

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(*"indistinguishable from schizophrenia" according to Osmond & Abramo in The Schizophrenias Yours and Mine*)

The existence of "amphetamine psychosis" is well documented. Although there is conflicting evidence as to the relative importance of drug effect vs. underlying personality factors in the precipitation of this psychotic state, Beamish & Kiloh,⁴ Hampton,¹⁰ and Young & Scoville¹⁸ believe that it is produced primarily in persons who already manifest a personality disorder or predilection for paranoid reaction. Connell,⁵ however, suggests that the phenomenon is primarily precipitated by the effects of the drug itself. There has, unfortunately, been a singular lack of data for comparison of amphetamine abusers who develop psychosis with those who do not. Another equally important and equally uninvestigated problem is whether certain individuals prefer the use of amphetamines over other available drugs. The author believes that these neglected areas must be studied if the phenomenon of amphetamine psychosis is to be fully understood.

The aims of this study, therefore, were threefold: (1) to afford a detailed description of individual reactions to the use of large doses of amphetamines; (2) to investigate and evaluate differences in reaction patterns within the amphetamine addict population and to explore reasons for these differences; and, (3) to differentiate between the types of individuals who are consistently drawn to the use of amphetamines and

those addicts who prefer other drugs.

METHODOLOGY

Subjects for this study were selected from the admission wards of the United States Public Health Service Narcotic Hospital in Lexington, Kentucky. The only criterion for selection was the use of large daily doses of amphetamine (exceeding 30 mg.) continued over a three-month period within the past two years. These subjects constituted the amphetamine group or "abusers."

The primary source of data was the patient's response to a standard structured interview, administered after at least two weeks complete withdrawal from all drugs. The same psychiatrist conducted and evaluated in a similar fashion all interviews, which focused upon: (1) patient's recollection of psychological and physiological reactions during the period of heavy amphetamine abuse; (2) *major patterns of perception and thinking while off drugs*; (3) assessment of personality; and, (4) developmental history. An attempt was also made to identify specific behavioral sequences stimulated by amphetamines. The first half of the interview consisted of a series of nonleading questions designed to establish the presence or absence of specific symptoms and behavioral patterns (Table 1), which had proved significant in previous work with amphetamine addicts. Many items used by Connell⁵ were included for purposes of comparison. The latter part of the interview was open-ended to facilitate discussion of unique reactions to the amphetamines. Most patients were well aware of the

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TABLE 1
TOTAL AMPHETAMINE AND GENERAL
ADMISSION* GROUPS COMPARED

Characteristic	Total Amphetamine Group	General Admission Group
Age Range	18 - 41	18 - 63
Mean Age		
Men	30	31
Women	26	30
Caucasian		
Men	60%	60%
Women	93%	60%
Married		
Men	20%	27%
Women	13%	40%

* From a previous study.¹⁷

amphetamine psychosis either in themselves or others, and, except in two paranoid patients, there was little or no hesitancy to discuss the psychosis. One noteworthy feature of the interview was the acute memory patients had of the psychotic experience, including places, time and extraneous details. This hyperamnesia¹⁷ facilitated obtaining a detailed description of the psychosis. At least two-and-one-half hours were usually required for each interview.

Psychiatric evaluations and Minnesota Multiphasic Personality Inventory (MMPI) testing at the Lexington Narcotic Hospital are routinely carried out approximately one week after withdrawal from all drugs. All the post-drug diagnoses discussed in this study are taken from this evaluation. The evaluations from both this and a previous comparison study¹⁷ were made by the same group of psychiatrists. The results of individual routine MMPI testing are always compared with a standardized Lexington addict profile. This standardized profile is used in this study as a control with which to compare the amphetamine addict profiles.

Following the interview, patients were categorized as amphetamine psychotic or nonpsychotic according to the presence or absence of all three of these symptom clusters: (1) fully formed visual hallucinations; (2) hallucinations of voices which were perceived as speaking directly to the patient; and, (3) moderately well organized delusions of persecution or gross paranoid reactions. If less than all of these three symptom criteria were present, the patient was assigned to the nonpsychotic group. It is necessary to emphasize that the terms "psychotic" and "nonpsychotic" as used in this paper refer to the status of subjects *while on amphetamines*,

not to the diagnosis made after withdrawal from all drugs. Ten of the 25 amphetamine addicts were considered psychotic; eight, nonpsychotic. Of the seven addicts who fell into neither group, four exhibited only one or two of the above symptoms, and three exhibited psychotic symptomatology when not taking amphetamines though they were free of major psychotic episodes when taking the drug regularly. While the latter two groups present themselves, they shall, for the sake of clarity, be omitted from the following discussion, although they are included in the accompanying tables and figures.

To test symptom differences between the psychotic and nonpsychotic groups, the data were cast into two-by-two contingency tables. Significance levels were then determined using the Fisher exact probability test.

SAMPLES

To discover any outstanding differences between the amphetamine addicts and the general addict, the present data were compared with those of a previous investigation¹⁷ concerned with characteristics of the general addict population of Lexington Narcotics Hospital. The sample of general addicts included amphetamine abusers.

The total amphetamine group comprised 25 subjects—ten men and 15 women.* The general Lexington admission population sample included 81 men and 30 women. (See Table 1 for a demographic comparison of the two groups). It was noted in the previous study and confirmed by the present sample that amphetamine users were more withdrawn, sociopathic, resentful of authority and had a higher incidence of nondrug psychiatric hospitalizations than the usual addict. Their incidence of previous juvenile delinquency was higher, and they had been more frequently admitted to reform schools.

RESULTS

Symptomatology.—Many symptoms of amphetamine abuse were common to both psychotic and nonpsychotic states (Table 2) and showed no continuum of severity toward psychosis. Hand-face touching and picking, gritting or gnashing teeth, an acute sense of novelty, distortion of time sense, and depression upon withdrawal were reported by both psychotic and nonpsychotic groups. Many physiological symptoms (e.g., insomnia, alertness, lack of appetite, difficulties in

*Because of administrative convenience, the selection process was begun earlier for women than men, thus accounting for the over-representation of women.

TABLE 2
PSYCHOTIC SYMPTOMS AND BEHAVIORAL CHARACTERISTICS
IN THE NONPSYCHOTIC VS. THE PSYCHOTIC GROUP

Psychotic Symptom or Behavioral Characteristic	Non-Psychotic (N = 8) %	Psychotic (N = 10) %	Total Amphetamine (N = 25)† %
Psychotic Symptoms			
Suspicious and aware of being watched (a presence)	50	100*	80
Organized paranoid behavior††	0	100	56
Gross all prevailing paranoia	0	70**	28
Ideas of reference	13	100***	52
Auditory hallucinations (noises)	0	100***	56
Auditory hallucinations (voices speaking to patient)††	0	100	48
Auditory hallucinations (conversations with voices)	0	50*	20
Visual hallucinations (peripheral vision fleeting)	38	100*	60
Visual hallucinations (fully formed and stable)††	0	100	44
Tactile hallucinations	13	70*	44
Olfactory hallucinations	0	70**	36
Change or distortion in body schema	13	80*	44
Persistence of hallucinations beyond 2 weeks of withdrawal	0	70**	36
Felt some of the bizarre experiences were real	0	80**	32
Behavioral Characteristics			
Libido same or decrease	88	10**	52
Libido increase	13	90**	48
Polymorphous sexual activity	13	80*	48
Concern with eyes, faces and their distortion	13	100***	56
False recognition of faces	25	80	52
Attracted to shiny objects and shadows	13	90**	44
Philosophical concerns	38	80	52
Increased deja vu	13	70*	44
Estrangement	0	60*	32
Curiosity, examination and dismantling of objects	25	90*	60
Acute sense of novelty	38	70	60
Attachment to transition objects	13	30	24
Depression on amphetamine	13	30	28
Depression on withdrawal	38	50	52
Terror and fear	30	70	60
Hand-face touching and picking	50	50	56
Gritting and gnashing teeth	63	70	68
Increased activity (task specific)	75	20	40
Inactive diffuse pattern (daydreamer)	0	60*	36
Dominant and aggressive pattern	62	30	52
Passive pattern	38	70	48

† Included in total amphetamine group are seven patients who fit into neither the nonpsychotic nor the psychotic group.

†† Psychotic criterion symptom.

* p less than 0.05.

** p less than 0.01.

*** p less than 0.001.

loquacious: excessive talking
ambivalence: contradictory emotional or psychological attitudes

micturition, thirst, diaphoresis and increased energy, were also noted by both groups. Most addicts noticed loquaciousness, decreased ambivalence, a sense of cleverness and "crystal clear thinking" and an "invigorating aggressiveness," especially during initial amphetamine use. Both psychotics and nonpsychotics appeared to have had a hyperacute memory during the period of abuse both for relevant and extraneous material. Several symptoms that were specifically sought, but which were found to be rare, were synesthesia, micropsia, macropsia, visual perseveration, gross confusion, disorientation, aphasias, and calculating difficulties.

Some characteristics were present in both psychotics and nonpsychotics but became progressively more severe as the psychosis developed. Fear, suspiciousness, awareness of being watched, and visual hallucinations in the peripheral fields were quite definitely progressive. Practically all patients at some time became suspicious. Awareness of being watched was prominent when the patient was in crowds, alone, or in the dark and was not infrequently a ubiquitous feeling that someone was watching from behind or from the side. This symptom, not unlike "a presence" (symptom noted in parietal lobe lesions), became organized in the more serious psychoses. Repeatedly, reports were given of heightened awareness and over-reaction to slight movements in the peripheral vision which became a stimulus for initial illusions.

Over half the patients developed well formed delusions of persecution which appeared to be an extension of this suspiciousness and awareness of being watched. The contents of these delusions were often in keeping with the characteristic objective circumstances of the addict group, such as federal agents and incarceration. Of the few patients that were found to have been paranoid before starting on amphetamines, the drug appeared to have either little effect on the psychosis or to accentuate it. Among these patients, more common delusions were found (e.g., they were persecuted by communists, Martians, evil spirits, racial prejudice, and specific people). They were more often deluded that they were being affected by poisoned gas, or poisoned fruit.

Fear and terror were major symptoms mentioned mainly by psychotics. Frequently, the fear was associated with delusions or hallucinations, but others described a diffuse anxiety, especially over losing control. Occasionally the fear tended to abate as the delusional reasons for the fear were organized. Periods of acute terror were described in which the patient reacted to the slightest stimuli. It was not uncommon for patients to hide alone for weeks from their tormentors.

One attempted suicide in a state of acute terror.

Philosophical concerns increased as patients became progressively psychotic. Such concerns were usually unsophisticated dealing with "beginnings, meanings, and essences." Revelations of significant insights were frequently experienced. These eureka experiences often ushered in prolonged periods of thinking about "the meaning of life." One patient's description was "everything became relative to some truth, a light ray would prove unity, a light ray breaking up would prove why men break up . . . I suddenly discovered how the world began." Another patient said, "I began to put details together from the past and present. Now I think I know what is going to happen to this world." Intense religiosity and involvement with Zodiac systems were also noted. Later, philosophical involvements degenerated into delusional systems. Two processes that were common to both philosophical and delusional concerns were sudden insights and compulsions to analyze a variety of details to find meaning and explanations.

Hallucinations occurred in over half of the total amphetamine group. Fourteen patients developed auditory hallucinations; 15 developed visual hallucinations; all but three who had auditory hallucinations also had visual hallucinations. Visual hallucinations started with fleeting glimpses of just recognizable images in the peripheral vision. The hallucinations later became more individualistic: some saw God, people involved in sexual activity, tormentors, buildings crumble, animals, Martians, angels and cities in the sky. Auditory hallucinations began with the patient's perception of simple noises or voices which whispered or called his name. The identity of the voices was usually unknown, but this appeared to be unimportant to the patient. Often psychotic patients perceived voices as either friendly or evil, and they devised elaborate methods to distinguish between them. In the more advanced psychoses, the patient conversed with them. Tactile hallucinations presented in seven patients, but all were incorporated in visual hallucinations. For example, patients reported infestations of microanimals and the presence of vermiform and encysted skin lesions which they felt as well as saw. Three patients had punctate scars incurred when they attempted to dig out these encysted parasites. The hallucinations became integrated into delusional material as the patient became more psychotic.

Gross distortions of bodily image were also highly correlated with psychosis. Such changes varied in degree from slight alterations in size, consistency, or color of the whole person. Some patients alleged that the right and left sides appeared separated at times or that the action of one side was antagonistic to the other. Vivid

autoscopic experiences were reported by five patients. Many patients also experienced a vague loss of body boundaries and described their bodies as ethereal or transparent. They felt that others could see their feelings and read their minds. Overemphasis of visual cues and selective disregard of somesthetic sensation was apparent in the descriptions. Interestingly enough, these same patients felt themselves capable of projecting themselves to distant locales and of controlling by thought people and objects which might in turn control them.

The majority of amphetamine patients exhibited a heightened awareness and concern with faces and eyes. Such concern appeared early in amphetamine abuse, deepened as the psychosis progressed, and gradually degenerated to gross distortions of facial expressions and physiognomy. An evil cast to faces was described by half the patients, but some stated that faces were simultaneously evil and kind. Ten patients reported marked distortions. Faces melted, faded, and appeared with stockings or masks over them; blood and bone appeared; eyes changed slant and shone; faces became hairy, developed deep crevices and lines, glowed and were transformed to witches and monsters.

Both psychotics and nonpsychotics commonly reported the symptom of false recognition. These patients often falsely identified strangers as family or friends. Many accosted strangers on the street and began intimate conversations. When this symptom became more florid, everyone looked like an intimate acquaintance.

Recognition in situations other than facial recognition was heightened and distorted. *Deja vu* experiences on amphetamines were difficult to evaluate because most patients had noted such experiences both on and off amphetamines. However, 11 patients stated they had an increase in *deja vu*, and eight reported experiences of estrangement and/or depersonalization. *Deja vu* experiences were recalled in detail.

Personal reference and significance revealed a biphasic response to amphetamines. Initially, the drug relieved any acute sensitivity to what others thought or felt. The constant reference to one's self seen in many sensitive people was relieved. They felt confident and aggressive. Later, they became suspicious, self-conscious, and self-referent. In some patients, self-reference and the constant searching for significance and meaning in the environment appeared to have a potentiating interaction that often subsequently developed into delusional systems. Ideas of reference developed fully in 13 patients. In the beginning stages, patients over-identified with characters on television, or would hear a reference made to himself or associates. Gradually, the messages became personally directed; finally the news media and others

"knew too much." The more psychotic patients moved to talking directly to the television or radio. Television, radio, and electrical equipment were often viewed as vehicles of control and manipulation.⁸

An acute sense of novelty and curiosity presented early in amphetamine abuse. Novelty was less pronounced than curiosity and was related to the heightened awareness of objects especially in the peripheral vision. Curiosity was not related to peripheral vision and did not need an immediate external stimulus for its evocation. Not only was it directed toward people, but also to inanimate objects which were frequently anthropomorphised.

Concurrent with the changes in awareness and curiosity, objects took on new emotional significance; many became "overcathected." As with most paranoid illness, this significance and meaning was eventually referred to the self. Five patients became greatly attached to childhood transition objects, such as small stuffed animals. For others, neutral objects (windows, chairs, pencils) took on an evil cast. The more paranoid patients concretized the experience to poisoned food (especially fruit) and drink. Altered object evaluation was manifest in other ways too. Fifteen patients described a compulsion to take objects apart, to analyze, to sort, and on rare occasion, to put back together. These patients "analyzed" details in a very concrete and repetitive manner. More abstract visuoconstructive trends were noted, such as reading blue prints, analysis of material in terms of color, pattern and weave. The more paranoid patients tended to search intensively for signs and meaning. One patient stated, "I looked everywhere for clues—under rugs, behind pictures—and took things apart. I read magazines looking at periods with a jeweler's glass for codes . . . they were to help me solve the mystery."

Changes in libido were found to vary extensively, corroborating the findings of other investigators (Bell & Trethowan² and Fox & Lippert⁹). However, an increase in libido and polymorphous sexual activity most often preceded the psychoses. The nonpsychotic group reported that amphetamine use either decreased libido or had no effect. The increase in libido was described as a driven state, in which orgasm was either absent or prolonged for hours. The polymorphous sexual activity was mainly a marked increase in orogenital activity but also included extreme masochism and other sexual deviations. These changes in sexuality were most striking in those females who were frigid when abstaining from amphetamines.

Different patterns of physical activity while on amphetamine were reported: (1) active (characterized by

obsessions with a specific immediate task), and, (2) relatively inactive (daydreaming, withdrawal or diffuse activity). The nonpsychotic group fit the active category, and the psychotic group the relatively inactive category. While on amphetamines, the nonpsychotics were found to be relatively aggressive and dominant, and the psychotics passive.

Developmental and Personal Characteristics.—A detailed developmental history of parent-child relationships and the patient's preadolescent reaction pattern to his parents was recorded, categorized and rated on a five-point scale. Few differences were found between the psychotic and nonpsychotic groups, although nonpsychotics appeared to rely more heavily on manipulation of parents and tended to become identified with the more aggressive parent.

Female patients were noted to have a high incidence (73 per cent) of first memories involving their father or his surrogate. In several females, these memories, along with reported dreams, seemed related to sexual conflict. The psychotic females were more prone to have first memories about their fathers than the nonpsychotic group (70 vs. 25 per cent). In contrast, 60 per cent of the males (all of whom were in the psychotic group) reported first memories dealing with feelings of helplessness, ineptness, or shame. Only one of the developmental characteristics used by Connell was found to be associated with psychosis in this study, i.e., "No friends at school" (Table 3). The incidence of several personal

TABLE 3
CHILDHOOD TRAITS

Trait	Non-Psychotic (N = 8) %	Psychotic (N = 10) %	Total Amphetamine (N = 25) %
Tantrums	25	30	24
Nail-biting	50	40	48
Severely afraid of dark	38	40	36
Severe nightmares	25	20	20
Sleepwalking	13	10	12
Eneuresis	13	10	16
Truant	50	70	68
Antisocial activity before age 15	38	60	56
No school friends	13	80*	52
Not keen on games	62	50	56

* p less than 0.05.

TABLE 4
PERSONAL TRAITS

Trait	Non-Psychotic (N = 8) %	Psychotic (N = 10) %	Total Amphetamine (N = 25) %
Poor work record	50	60	64
Ennui	25	60	48
Late Sleeper	38	60	52
Alcoholism	38	40	32
Delerium tremens	0	10	8
"Daydreamer"	25	50	44
Prolonged homosexual relationship	25	10	16
Childhood memory repressed	38	0	24
Childhood memory average	50	30	40
Childhood memory full	13	70*	36
Predominantly verbal memory	75	30	48
Predominantly visual memory	25	70	52

* p less than 0.05.

traits was rated to be high in both groups (Table 4) but, except for patterns of thinking, did not serve to differentiate between the two. In the nonpsychotic group, there was a greater tendency toward verbal thinking with little visual imagery (Table 4). They did not daydream frequently, but when they did, often daydreams consisted of carrying on conversations with themselves. They also appeared more often to remember in sequences and by details. Two of these patients spontaneously mentioned a compulsion to count when anxious, or when others might ordinarily daydream. These compulsions had been present since childhood. A precise and articulate memory was also noted, though to a much lesser extent, in the psychotic patients. Three patients in the psychotic group had strong verbal recall and little, if any, daydreaming, except in the verbal mode. One even had marginal facial agnosia and lack of revisualizing ability. The psychotic group in general had less precise memories, which were more visual, intuitive, emotionally colored, less sequential and detailed. Memory of childhood events, however, was more accessible* in the psychotic group (Table 4).

* Accessibility was evaluated on the basis of age of first memory and fullness of memory for both pleasant and unpleasant events.

TABLE 5
DOSE LEVEL AND
DURATION OF AMPHETAMINE ABUSE

	Nonpsychotic (N = 8)	Psychotic (N = 10)
Average maximum daily dose for at least 3 months*	170 mg. (range 60 - 300 mg.)	310 mg. (range 120 - 500 mg.)
Average duration of abuse	3.1 yrs. (range 4 mos. - 6 yrs.)	2.2 yrs. (range 5 mos. - 6 yrs.)

* The difference between the psychotic and the nonpsychotic groups is significant at p less than 0.05.

Length and Tolerance of Amphetamine Habit.—Eighteen patients had abused amphetamines for at least one-and-one-half years. The nonpsychotic group had taken amphetamines longer, but at lower doses (Table 5). There was no preference for a particular type of amphetamine in either group. Five patients from each group had at times used either barbiturates or narcotics with the amphetamines. The dose relationships raise the question of why the psychotic group continued to increase their amphetamine level in the face of progressive psychosis.

Psychiatric Diagnosis.—Among the post-withdrawal diagnosis, antisocial reaction was the most frequent diagnosis in the nonpsychotic group (Table 6). However,

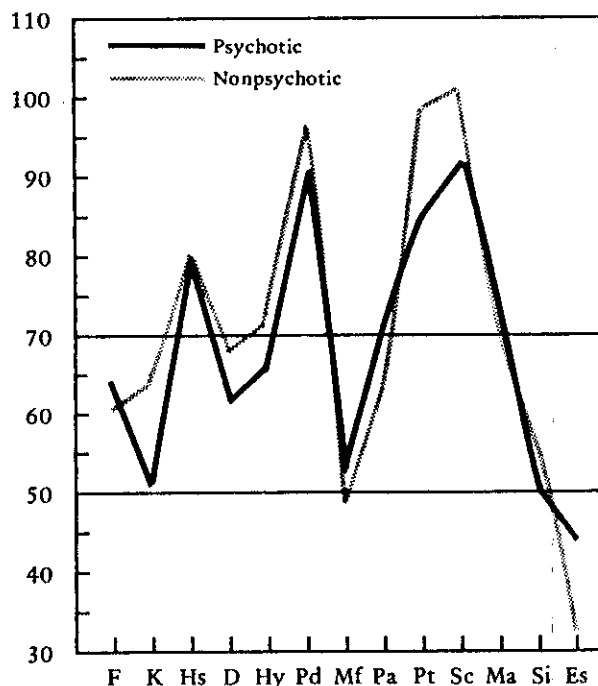
TABLE 6
DIAGNOSTIC CATEGORIES

Diagnosis	Non-Psychotic (N = 8) %	Psychotic (N = 10) %	Total Amphetamine (N = 25) %
Schizophrenic reaction	0	40	20
Manic depressive reaction	0	10	4
Antisocial reaction	50	0*	20
Schizoid personality	0	20	20
Paranoid personality	0	0	4
Personality trait disturbance	50	30	28
Adolescent adjustment reaction	0	0	4

* p less than 0.05.

hysteria was noted as a common factor in the four personality trait disturbances in this group. In contrast, the psychotic group received no less than four diagnoses of a schizophrenic reaction: three patients were diagnosed as personality trait disturbances, two as schizoid personalities and one as a manic depressive reaction, manic type. The six patients with a psychotic diagnosis had persistent hallucinations when interviewed. Each also had previously either withdrawn from drugs or had had a prolonged hospitalization with continued hallucinations. Five of these were still convinced that some of their bizarre experiences were real. Composite MMPI profiles for the psychotic and nonpsychotic groups revealed remarkably similar patterns and peaks (Figure 1). Both showed peaks on the psychopathic deviance, psychasthenia, hypochondriasis, and schizophrenic scales in a pattern consistent with a disturbed borderline personality.

FIGURE 1
M.M.P.I. COMPOSITE OF AMPHETAMINE
PSYCHOSIS AND NONPSYCHOSIS



Psychiatric diagnoses of patients in both the amphetamine abusers and in the general addict sample¹⁷ shown in Table 7 were made by the same examiners. Because the incidence of psychosis, schizoid and sociopathic personality diagnosis had been high in amphetamine users in a former study,¹⁷ these diagnoses were compared between these two samples. In this sample of

TABLE 7
DIAGNOSTIC COMPARISON OF AMPHETAMINE ABUSERS AND GENERAL ADDICT SAMPLE

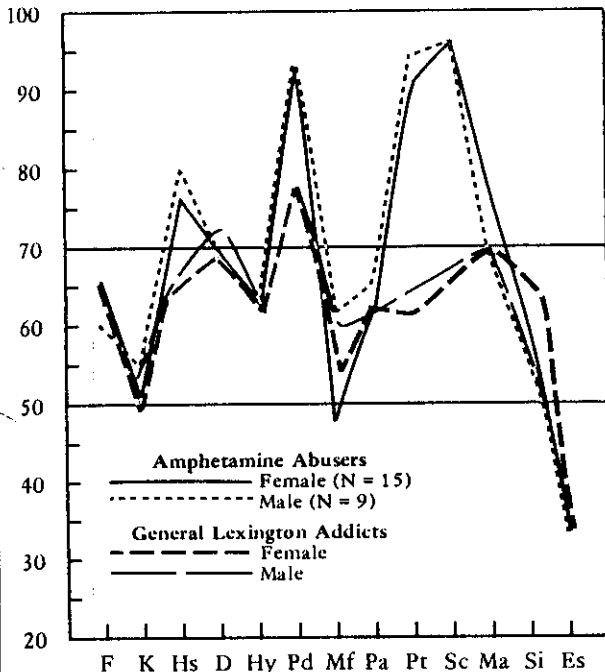
Diagnosis	Amphetamine Abusers		General Addict Admission	
	Male %	Female %	Male %	Female %
Schizoid personality	40	13	14	3
Sociopathic personality	0	40	17	3
Psychotic diagnosis	20**	26	0	7

** p less than 0.01.

amphetamine abusers there is again noted the high incidence of these diagnoses except for an unexplainable lack of the sociopathic label among males.

There are differences in the amphetamine vs. the general Lexington addict MMPI profiles on psychopathic deviance, schizophrenia, psychasthenia, and hypochondriasis scales (Figure 2). Two-tailed *t*-tests were calcu-

FIGURE 2
M.M.P.I. COMPOSITES OF AMPHETAMINE ABUSERS COMPARED WITH GENERAL LEXINGTON ADDICTS



lated for the differences between these peak scores and the average Lexington addict for each sex separately. The hypochondriasis scale was significant at *p* less than 0.05, and all other peak score differences were significant at *p* less than 0.005. Thus, from both diagnostic and psychological test data, there is evidence that amphetamine abusers are different from other addicts. Patients drawn to use amphetamines are more sociopathic, and exhibit more eccentric and bizarre behavior.

DISCUSSION

From the above data, it is clear that many differences exist between amphetamine addicts and a general addict population, as well as between amphetamine psychotics and nonpsychotics. The most notable difference, and the one which provides the most significant clue to the solution to the questions posed in the introduction to this paper, lies in the psychiatric diagnosis of the individuals in the addict groups. It has been shown that antisocial and schizoid personalities, as well as schizophrenic reactions, constitute 60 per cent of the diagnoses of the patients addicted to amphetamines, a far higher percentage than was found in the general addict population.

Why should these individuals be drawn to amphetamines? There are several lines of evidence which suggest reasons why psychopaths prefer to use amphetamines rather than other drugs. Clinicians have reported some success with the administration of amphetamines in the treatment of psychopathic states and behavioral disorders, particularly those involving aggression, hyperactivity, and hypersexuality (Bradley & Bowen,³ Hill,¹¹ and Hill & Watterson¹²). This success may be due to the initial calming effect described by the patients in this study. The paradoxical question of why a stimulant drug should produce a calming effect remains unanswered.

Psychopaths have been found to have an almost childlike capacity for novel stimulation. They seek it out. In fact, Quay¹⁶ has explained psychopathic behavior in terms of the need for varied sensory input which leads to an extreme stimulus-seeking behavior. This continued search for new stimuli may stem from insufficiently internalized objects, schema and categories. Because he fails to internalize his experiences, the psychopath's ability to form a self-image is limited. He conditions poorly¹³ and shows little anticipation of coming events either psychophysiological or cognitively.¹ His poor conditioning performance applies to both avoidance and approach tasks, and he conditions best under partial reinforcement.⁸ Fox and Lippert⁹ found that psychopaths have significantly fewer spontaneous galvanic skin responses, which may be indicative

of internal arousal. Mundy-Castle and McKiever¹⁵ had already shown that subjects with few endogenous galvanic skin responses habituate rapidly to repetitive stimuli. In Pavlovian terminology this could be stated as a predominance of external inhibition and a relative lack of internal inhibition. Thus, the psychopath appears to have reduced internal mechanisms for nonspecific arousal and for retaining the emotional or conditioned significance of stimuli.

Amphetamines may produce their paradoxical calming effect in these individuals by stimulating internal arousal mechanisms and, thereby, reducing the need for novel environmental stimuli. These arousal mechanisms become grossly hyperactive in the psychotic amphetamine abusers. The initial "organizing and energizing" effect of amphetamines described by schizoid and schizophrenic patients may also be due to increased internal arousal, but this needs study. Whether certain schizophrenics and psychopaths have similar defects in their internal arousal and attention mechanisms is unclear, but such a finding would account for the preference for amphetamine noted in both the psychotic and nonpsychotic groups, between whom there are certain common features. Arieti¹ and others have noted that reactive schizophrenics often reconstitute at the psychopathic level. Histories of the schizoid and schizophrenic patients in this study certainly were often remarkably similar to the patients diagnosed as pseudopsychopathic schizophrenics by Dunaif and Hoch.⁶

The separation between the psychotic group and nonpsychotic group of amphetamine addicts also rests primarily, though not entirely, on their psychiatric diagnoses upon their withdrawal from drugs. Patients who had developed the amphetamine psychosis were more often designated as schizoid or schizophrenic, while those who had not were found more often to be psychopathic. Other characteristics appeared to fit this pattern as well. Nonpsychotics tended to be more manipulative, identified with the aggressive parent and had more articulate memories. Psychotics were more passive, sensitive, fearful, felt inadequate and lethargic, were daydreamers and had visual memories. They tended to have been "loners" as children. Since five of the amphetamine psychotic patients continued to experience psychotic symptoms long after amphetamine withdrawal, an underlying psychotic process is indicated. It is unknown whether amphetamine contributed permanent effects to this psychotic process. Based upon the past histories of these five patients, it is the opinion of this investigator that amphetamine abuse was only a moderate contributing factor to this underlying psychotic process. It certainly was, however, the active

catalyst in initiating the acute episode.

The amphetamine psychosis that was superimposed on the psychotic process that persisted beyond amphetamine withdrawal was qualitatively different from psychosis seen only with the drugs. As described previously, the amphetamine psychosis of the patients who were mentally clear after withdrawal was less bizarre than those of patients with an underlying psychotic process: their delusions and hallucinations were more reality-oriented. In these relatively more stable patients, the amphetamine psychosis was contiguous with the amphetamine use.

SUMMARY

A detailed behavioral description of amphetamine psychosis is presented. The usual paranoid psychosis is noted and some of the behavioral sequences leading to the psychosis are presented. Vision is the primary sensory mode in hallucinations, thinking disorders and body schema distortions. Vision is also prominent in an affinity for visuoconstructive tasks and in the ubiquitous feeling of being watched. Objects and events take on heightened emotional significance. There is a concern with inner workings and analysis of details, clues and signs. Philosophical excursions are noted often along with a general attempt to add up details in order to see the larger picture. Disorders of recognition are frequent, especially false recognition of faces. Faces are quite often distorted both on others and the patient. Body schema distortions were also frequent. Fear and terror are more prominent than depression. Sexual fantasies become elaborate, and there is a marked increase in libido and polymorphous sexual activity in many.

It was noted that amphetamine addicts differ from their fellow addicts on several variables: (1) they have a higher incidence of antisocial, schizoid and paranoid personalities; (2) they also have proportionately more schizophrenic reactions; and, (3) their Minnesota Multiphasic Personality Inventory profiles are significantly different. Psychosis, triggered by amphetamine abuse, appeared more often in the schizoid group than in the antisocial group. The mean amphetamine dose level was greater in the group of patients who developed psychosis than the group which did not.

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