

Drug Flashbacks. II. Some Additional Findings

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Abstract

A subsample was drawn from an earlier collection of data in order to answer a number of questions related to "acid" (LSD, STP) flashbacks. Acid users who reported flashbacks also reported significantly more marijuana use than those who did not; the two groups did not differ on use of other drugs, including acid. Simple correlations and multiple regression analyses both showed extent of marijuana use to be the only drug variable

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significantly related to acid flashbacks. No optimal combination of marijuana and acid improved flashback prediction. Among acid users, correlations between amounts of use for various drugs were high and significant, excepting only the marijuana-acid correlation.

This study is an extension of earlier research on reported drug "flashbacks" derived from a survey of 2,001 Army personnel entering and leaving South Vietnam (Stanton and Bardoni, 1972). Issues raised by readers of the original report (Anderson, 1973; Favazza, 1973) and the findings from a number of studies of hallucinogen and cannabis flashbacks (Table 1) have prompted us to further penetrate the data bank and perform additional analyses aimed at answering specific questions. These questions are: (1) Are flashbacks which are attributed to marijuana related in some way to extent of marijuana and/or "acid" (LSD, STP) use and can this question be answered more completely by looking at people who have used *only* marijuana? (2) Can the relationships between marijuana and acid, and flashbacks attributed to either or both of them, be clarified by looking at data from subjects who have used only these two drugs? (3) Among acid users, what correlations exist among usage levels for various drugs? (4) Among acid users, are acid flashbacks related to extent of marijuana use, or for that matter, to the use of any other drugs? (5) Does level of acid use affect the correlation between extent of marijuana use and occurrence of acid flashbacks?

METHOD

The methodology for the data-gathering process has been presented elsewhere (Stanton, 1972; Stanton and Bardoni, 1972) and will not be discussed. Suffice it to say that these analyses will deal with several subgroups from the overall sample, including: (1) all 241 respondents who reported acid use, (2) 12 respondents who reported having flashbacks which they attributed to marijuana, (3) 31 "habitual" marijuana smokers who reported use of no other drug, and (4) 31 respondents who had used both marijuana and acid but no other drugs. Obviously some respondents are included in more than one of the subgroups. (The fact that the last two subgroups each include 31 people is only a coincidence.)

Respondents reported the extent to which they had used a particular drug by checking one of 10 categories, i.e., "none," "1-5 times," etc., up to "200 or more" times. These data were transformed by assigning

consecutive numbers from zero to nine to the checked categories since use of the original numbers would mathematically exaggerate differences which we felt were conceptually inaccurate (e.g., does the difference between 81 and 200 marijuana doses really mean that the latter user is 2.5 times as great an abuser?). The relationship of the original and recoded categories can be seen in Table 2. Respondents were asked to separately check their drug use while in Vietnam and before coming to Vietnam. Thus, if a person checked that he had used marijuana 200 or more times both before coming to and while in Vietnam, his usage score would be 9 plus 9, or 18; this is the maximum score that could be obtained from the recoded categories. All data analyses, then, were performed on drug usage scores ranging from 0 to 18. [This transformation has the effect of reducing the weight given to extreme scores (e.g., 200+), thus reducing the likelihood that a few people with high scores would unduly affect the overall results.] The number of subjects used per analysis may differ due to missing data for some individuals.

RESULTS

Flashbacks Attributed to Marijuana

To analyze the relationship between marijuana and acid use as they relate to flashbacks, the 12 people who attributed flashbacks to marijuana were isolated. They were then divided into two groups: (I) "habitual" marijuana smokers, i.e., 200 or more times used; and (II) nonhabitual smokers.* The two groups were then compared as to their acid use and the results are presented in Table 2. It should be noted that only five of the 12 were "habitual" marijuana smokers. Three of the 12 reported acid use, and these were also among the five "habitual" marijuana users. Four of the five "habitual" smokers had used at least three other drugs. Three of the nonhabitual and one of the "habitual" smokers used marijuana exclusively.

Among the total group of 877 marijuana users, 379 used marijuana exclusively and 31 of these were identified in our earlier studies as "habitual" marijuana smokers. This group was scrutinized because it was

* "Habitual" is used for want of a better term and is borrowed from our earlier work (Stanton, 1972). It referred to those soldiers who had used marijuana 200 or more times. If they had been in Vietnam during the previous year, they had to use the drug at least every other day on the average in order to reach 200, hence the term "habitual" user.

Table 1
Comparison of Selected Hallucinogen-

Author	Subjects	% Reporting flashbacks	Subjects' drug use
MAJOR HALLUCINOGENS			
Blumen- field (1971)	431 male, Air Force basic trainees with a history of drug abuse	20%	Drug use prior to service (one or more time used) <i>N</i> = 431 Narcotics 16% Hallucinogenic drugs 98% Amphetamines or barbiturates 14%
Cohen (1960)	Approximately 5,000 research subjects or patients who had received LSD or mescaline	0 for LSD (4 investiga- tors report cases for mescaline)	Average no. of times used either drug (all subjects): 5; range 1-80. LSD dosage range: 25- 1,500 mcg. Mescaline dosage range: 200-1,200 mg
Horowitz (1969)	Case histories of 3 young males	—	Case 1 had used marijuana, DMT, methedrine, LSD, and LSD with arsenic Case 2. Numerous trips on LSD and marijuana Case 3. 10 LSD trips and 100 marijuana smokings
Matefy (1973)	17 year old student self-referred to mental health clinic	—	"A long history of intense drug use." Last LSD trip was 5 months before flashback. Pa- tient on Thorazine before and during treatment
Matefy and Krall (1973)	44 college students (1/2 of whom were selected because they reported FB)	—	Not presented in detail. No dif- ference between the 2 groups as to drug-taking history ex- cept that more nonflash- backers than flashbackers took LSD or related drugs less than 6 months before interview.

and Cannabis-Related Flashback Studies

Study limitations	Explanation of flashbacks
Subjects were self-admitted drug users in a military population. The survey was not anonymous as they were identified to their military commanders. Criteria for flashback not defined. No details as to drug use, personality, etc., of flashbackers or nonflashbackers. All hallucinogenic drugs lumped together. All types of flashbacks (FB) lumped together when determining incidence of FB's	Reviews several theories. Claims many FB's brought on by stresses of adjusting to the military setting. FB is viewed as an externalized manifestation of the individual's inner turmoil and conflict
Data received second-hand from 44 investigators with no details about the subjects. No estimation of frequency of FB's among mescaline users or comparison of flashbackers and non-flashbackers.	Report fleeting recurrence of the mescaline state following a recovery period. Estimate such relapses to be more frequent with mescaline than with LSD
Small number of cases selected only to illustrate FB phenomena. No estimates of FB incidence/frequency	Compares four different theories; subscribes to none
Only 1 case which was presented to illustrate appropriateness and success of behavior therapy. Drug history not defined. Personality factors appear to be of greater importance than pharmacological and former not described	Role-learning theory. Reaction learned during state of high physiological arousal from drug use. Flashback is stress produced and is simulation of drug trip by enacting role demands of the drugged individual. In this case FB most often occurred in social crowd situations
Subjects volunteered in response to newspaper ad. Vague about methods for selecting subjects (criteria for inclusion, etc.). Methods for quantification of drug use levels not presented	Subjects' reports: 27% attribute to brain defect, 23% to unconscious material, 18% recall of past experience. Pre-FB feelings: 28% anxiety/stress, 55% could not pinpoint. Authors: not support attentional deficit and latent psychosis theories (although MMPI Paranoid scale higher for flashbackers, $p < .10$)

(continued)

Table 1

Author	Subjects	% Reporting flashbacks	Subjects' drug use
McGlothlin and Arnold (1971)	247 (1/2 of whom were psychotherapy patients). Mean age 44; 2/3 male; most with high socioeconomic status	15% (24% for those with 10 or more LSD trips; 12% for those with less than 10)	LSD (medical administration only, $N = 247$): 1 time, 43%; 2 to 5 times, 34%; 6 to 20 times, 16%; 20+ times, 7%. Alcohol: moderate to heavy use, 45%; frequent sedatives, 21%; frequent stimulants, 26%; frequent tranquilizers, 26%; marijuana, once a week or more, 8%; other hallucinogens, 19%; opium, morphine, or cocaine, 7%; heroin, 4%
Robbins et al. (1967)	34 psychiatric admissions resulting from untoward LSD reactions; 18 male; ages 15 to 43; 91% unmarried	32%	FB's said to occur in people who had taken LSD a number of times and happened to be in an anxiety-producing situation. LSD use by total sample: 1 to 5 times, 53%; 6 to 10 times, 12%; 11 to 30, 15%; 31 to 100+ times, 20%
Rosenthal (1964)	23 year old White female artist admitted to hospital with persistent hallucinosis. Previous psychiatric history	—	10 to 12 experiences with LSD, mescaline and psilocybin during 6 months prior to admission
Shick and Smith (1970)	2 patients (1 male)	—	Case 1. Used LSD 6 months prior to FB. No other use reported. Case 2. A number of LSD trips, the last few described as "bad." Most recent trip 4 weeks prior to FB.
Smart and Bateman (1967)	225 cases gleaned from 21 different articles and reports. Most were students and/or psychiatric patients	5%	Of 11 cases from 6 studies, 6 had taken acid numerous times. Frequency of dosage for cases for which exact reports were given was much greater than for persons experiencing only prolonged LSD psychosis

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Study limitations	Explanation of flashbacks
Subjects were a combination of psychotherapy patients and experimental subjects/volunteers, i.e., a select group gathered by different means. No breakdown of drug use by those reporting FB's versus those who did not	Spontaneous LSD-like experience following, but not necessarily caused by the drug; "nothing more than the association of two events bearing certain similarities" (p. 46)
No further data given as to amount and kind of drugs used other than LSD, or what precipitated FB's. Flashbackers not differentiated from others as to drug use. Highly select group of people requiring hospitalization for their LSD reactions	FB judged to be complex and to involve both physiological and psychological factors.
Single case of person with psychiatric history. No FB incidence/frequency data	Reviews evidence for several theories. Proposes that with continued and repeated LSD use some effects may become permanent or semipermanent; these may be related to a specific toxic effect of the drug on the visual system
No data about previous use of other drugs. Both cases seen at clinic for adverse recurring reactions; in fact, most of the article's extensive discussion derives from authors' experience with people who had appeared at their clinic with adverse reactions, thus positive reactions were not reported	Comprehensive overview of evidence for different FB theories. Prefer psychological rather than chemical explanations. FB may be related to traumatic events within LSD intoxication itself, as frequently seen after bad trips. DOM (STP) and DMT also bring about FB's
Variability across studies as to type of subjects, selection methods, etc; not truly cross-sectional. Many gaps in subject information and drug usage histories. No dependable data as to FB incidence	LSD itself or some of its effects may persist or build up over repeated administrations; stress may also facilitate FB's

(continued)

Table 1

Author	Subjects	% Reporting Flashbacks	Subjects' drug use
Stanton and Bardoni (1972)	240 male Army personnel, entering and leaving Vietnam, who had used LSD	23%	No relationship found between probability of a flashback and extent of acid use. (See present paper for additional details)
Wallerstein and Pittel (cited in Horowitz, (1969)	25 youths from Haight-Ashbury.	28%	22 subjects: Massive drug use (more than 15 LSD trips plus use of other drugs) 3 subjects: 3 to 8 LSD trips. All who reported FB's had massive drug intake
CANNABIS			
Blumenfield (1971)	5 male Air Force basic trainees with a history of only marijuana use who reported FB's	—	Marijuana only. See the above for general usage figures
Favazza and Domino (1969)	1 male college student, age 18	—	Previous marijuana (twice a month for 6 months). 1 LSD trip which was reactivated 3 weeks later by marijuana
Keeler et al. (1968)	4 young men selected because they demonstrated spontaneous recurrence of marijuana effects. 2 of these were judged to be FB's	—	None had used any hallucinogenic drug other than marijuana. Flashbackers: Case 1: 4+ marijuana cigarettes. Case 2: 1 to 2 cigarettes 8 times per day over 7 days. Nonflashbackers: Case 1: 1 to 2 marijuana cigarettes. Case 2: 3+ marijuana cigarettes

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Study limitations	Explanation of flashbacks
No details as to definition of FB, FB occurrences (relative to drug intake), the conditions surrounding FB's and the personalities of the subjects. No data on number of FB's per person. No data on amount (magnitude) of dosage used by subjects	No support for <i>general</i> stress as contributing to FB incidence. No strong position taken as to explanation except that many FB's credited to other drugs may instead have originated from acid
Select group: representative members of drug-using community. No data as to what brought on FB's (e.g., stress) or number of FB's	Personality factors predominant. Only two of the flashbackers were felt to have "no evidence of psychiatric pathology sufficient to merit diagnosis" (p. 149)
No data as to percent of marijuana users experiencing FB's. Marijuana use not separated from other hallucinogenic drugs. See above	Assumes more potent forms of marijuana will breed more FB cases. See above
Only 1 case. Authors report the impossible feat of patient being too frightened to go to sleep for 3 weeks following FB. Subject's MMPI and response to phenothiazines strongly reflect a borderline or prepsychotic personality	FB can be marijuana-induced following a bad LSD experience; psychological more than pharmacological mechanisms involved, especially "stress"
Small number of selected case reports. Neither method of selection nor population from which drawn are given. No mention of previous use of drugs other than hallucinogens. No information as to personalities and predispositions of subjects	Two theories: (1) Persistent biochemical effect. (2) Mechanisms inherent in the visual system. Drug may disorganize sensory processing and attention systems

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Table 1

Author	Subjects	% Reporting flashbacks	Subjects' drug use
Stanton and Bardoni (1972)	877 Army personnel, entering and leaving Vietnam, who had used marijuana	1%	25% of marijuana FB reporters had also used LSD. (Further details presented elsewhere in the present article)
Tennant and Groes- beck (1972)	720 U.S. Army hash- ish users referred for medical or psychi- atric symptoms in Germany	0 (for those whose only illegal drug use was with hash- ish)	Marijuana/hashish Experimental or occasional 3% 1 to 3 times per week 54% 3 to 7 times per week 12% Several times daily 31%
Weil (1970)	8 people selected because they had ex- perienced hallu- cinogen FB's only when taking can- nabis	—	All patients used other hal- lucinogens in addition to cannabis

believed that if "habitual" marijuana use increased the probability of marijuana flashbacks, a disproportionate number of flashbackers would be among the 31. However, only one of them reported a marijuana flashback, while three of the remaining 348 (nonhabitual) users reported flashbacks. These numbers are too small to apply statistical tests of significance, but there was clearly no strong trend in favor of the hypothesis.

Exclusive Acid/Marijuana Users

To minimize the effect of other drug use on the acid-marijuana relationship, a "pure" group of 31 respondents was isolated from the group of 241 acid users. These respondents reported that they had used *only* acid and marijuana. Most of them, it turned out, were not heavy or habitual users of either drug. Three reported flashbacks and all of them attributed these to acid. Drug usage by these three was below the average for the overall group of acid users.

Drug Use and Flashbacks

The total group of people who had used acid ($N = 241$) was divided into three subgroups: Those reporting no flashbacks ($N = 171$), those reporting flashbacks attributed to acid ($N = 57$), and those attributing

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Study limitations	Explanation of flashbacks
See above	Personality and prepsychotic factors are paramount
No data as to number of "hashish only" users or those who used LSD and hashish. Select group of only medical or psychiatric patients	FB'S frequently described among patients who used both hashish and LSD; 15 patients recalled hallucinations experienced on a previous LSD trip while under the influence of hashish
No details as to who the subjects were, how selected, how representative they were, etc. No data as to FB incidence. No data as to drug use/history	FB's from experiences with other hallucinogens can sometimes occur only when taking cannabis

flashbacks to other drugs but not acid ($N = 13$).^{*} The respective means for marijuana use in these groups were 7.97, 10.75, and 11.31. An analysis of variance was calculated to assess the significance of the difference among these means. The overall F test on these means was significant ($F = 6.19$, $df = 2,238$, $p < .01$). Follow-up tests, using Sheffe's method, indicated that acid users who reported flashbacks also reported significantly more marijuana use than those who did not. The number of subjects attributing flashbacks to drugs other than acid was too small for meaningful, separate *post-hoc* significance tests.

Similar analyses of variance were calculated on the same three groups as to extent of their use of "speed," barbiturates, opium, heroin/morphine, and acid. None of these, including the last, yielded significant differences among the groups.

Correlations

To assess the association between amount of use for the various drugs surveyed, product-moment correlations were calculated for the 241 acid

* The N 's differ very slightly (241 vs 240 and 57 vs 55) from those originally reported (Stanton and Bardoni, 1972) due to (1) correction of an error, and (2) inclusion in the present study of a subject who was incorrectly eliminated from the earlier analysis.

Table 2
Drug Use by Twelve Respondents Who Attributed Flashbacks to Marijuana^a

	Marijuana use		Acid use		Other drugs used
	Pre-Vietnam	In Vietnam	Pre-VN	In VN	
I. At least 200+ ("Habitual")					
A	200+	200+	None	None	Speed (1-5), barbiturates (1-5), opium (1-5)
B	200+	200+	None	None	None
C	11-20	200+	1-5	None	Speed (61-80), barbiturates (6-10), opium (81-100)
D	200+	200+	1-5	6-10	Speed (1-5, 11-20), opium (21-40)
E	1-5	200+	101-199	101-199	Speed (200+, 101-199), barbiturates (200+, 200+), opium (41-60, 6-10)
II. Less than 200 ("Nonhabitual")					
F	0	81-100	None	None	Opium (1-5)
G	101-199	1-5	None	None	Opium (1-5)
H	1-5	1-5	None	None	None
I	0	61-80	None	None	None
J	0	21-40	None	None	Speed (6-10)
K	0	21-40	None	None	None
L ^b	11-20	—	None	—	Speed (6-10), heroin (1-5)

^a Data are reported in number of times used. Respondents checked one of ten categories of use:

Raw score	0	1-5	6-10	11-20	21-40	41-60	61-80	81-100	101-199	200+
Scale score	0	1	2	3	4	5	6	7	8	9

^b Respondent was entering country, thus no use in Vietnam.

Table 3
Correlations^a between Drugs and with Acid Flashbacks

	Mari- juana	Speed	Barbitu- rates	Opium	Heroin	Acid
Marijuana	1.00	.51	.44	.53	.17	.13
Speed		1.00	.62	.63	.34	.46
Barbiturates			1.00	.54	.43	.45
Opium				1.00	.44	.40
Heroin/ morphine					1.00	.53
Acid (LSD/STP)						1.00
Flashbacks to acid	.18	.03	.04	.05	-.02	.01

^a All correlations are rounded to the nearest one-hundredth.

users. These correlations are presented in Table 3. All are significant at least at the .01 level except those between marijuana and heroin ($p < .05$) and marijuana and acid (not significant). However, the correlation between marijuana and acid use *before* Vietnam was .27, while it was $-.02$ for use of these two drugs *in* Vietnam. Comparable "before" and "during" correlations for marijuana and heroin were .24 and .07, respectively.

Additional correlations were calculated between drug use and whether a person reported flashbacks attributed to acid. These correlations form a separate row in Table 3. It is worth noting that the correlation between extent of acid use and occurrence of acid flashbacks is not significant, while that between marijuana use and acid flashbacks *is* ($p < .01$).

Multiple Correlations

The best single predictor of acid flashback occurrence was marijuana use. To determine whether a combination of the usage of some or all drugs could improve the prediction of acid flashbacks, a multiple correlation was calculated on the data for the 241 acid users. The results indicated that marijuana use was the *only* significant predictor of acid flashbacks ($r = .18$). The addition of all other drug usage variables did not improve the prediction equation. (The multiple- R based on all 6 drug use variables only reached .20, a trivial improvement over marijuana use alone.)

A regression method (Cohen, 1968; Saunders, 1956) was used to study the interaction between extent of acid and marijuana usage to answer the question of whether extent of marijuana use should be differentially weighted, depending on the extent of acid use, in predicting flashback

occurrence. It was found that marijuana use did not correlate significantly differently with occurrence of acid flashbacks at different levels of acid use, i.e., the correlation did not differ for high and low acid users.

DISCUSSION *

It is interesting that a high proportion (nine) of the 12 people reporting marijuana flashbacks had avoided acid, and that most of these were also nonhabitual marijuana smokers. Evidently acid use does not facilitate flashbacks attributed to marijuana. Also, although the number of flashback reporters is too small to draw definitive conclusions, if one assumes that marijuana flashbacks are related to frequency of use, one might expect that more of the 31 habitual, exclusive marijuana smokers would note such phenomena. Underlying this assumption, of course, is the idea that more frequent use increases the chances of getting higher dosages, either due to residual factors which have a cumulative effect in the body, or simply because a habitual user is more likely to be exposed to higher dosages. In any case, while these data do not resolve the issue of whether marijuana flashbacks result from high dosages or more closely resemble the hallucinatory experiences of prepsychotic personalities, they clearly do *not* support the hypothesis that such flashbacks would require a history of particularly heavy marijuana use, i.e., over half of our flashback group were not habitual users. To this point, the senior author worked intimately over a 2-year period with one clinical case of a person with borderline personality who was occasionally plagued by marijuana "flashbacks"; these were depersonalized and semihallucinatory experiences predicated on a single marijuana exposure 2 years earlier. Treatment revealed that the recurring experiences were associated with homosexual fears and occurred more predictably when the patient encountered social situations where homosexual issues became salient. Indeed, the original smoking experience took place with a friend with whom the patient had engaged homosexually during adolescent years, giving credence to the expectancy and social setting factors delineated by Carlin, Bakker, Halpern, and Post (1972). If anything, the drug relaxed ego boundaries and released primary material with which the patient was not totally able to cope, but these were

* It should be noted that a small subsample of the original 2,001 respondents has been selected for study here. Essentially, this means that all the analyses presented are based on 15% or less of the original sample. We trust the reader will keep in mind the larger context from which these data have been extracted.

clearly not drug flashback phenomena in the usual sense. As in this instance, it may frequently be the case that others who have "flashbacks" which they attribute to marijuana find the experience frightening enough to cause them to avoid using it in the future.

Unfortunately, attention to the other pure group, i.e., the 31 exclusive acid/marijuana users, was not instructive. As we found in the marijuana flashback group, the small number of flashbacks involved (three) prohibited any definitive conclusions based on these data.

It is perhaps not surprising that use of various drugs is so highly correlated among acid users (Table 3). It is general knowledge that a trend has developed for polydrug use, so that heavy use of one drug is indicative of a similar rate of use in another. Further, at the time these data were gathered, acid was very difficult to obtain in Vietnam, and heroin was also not readily available. Such circumstances succeeded in attenuating correlations for these two drugs with marijuana which was in plentiful supply and frequently more easy to obtain than alcohol.

Lack of correlation in these data between extent of acid use and the existence of reported acid flashbacks is an extension of our earlier analyses (Stanton and Bardoni, 1972), i.e., heavy acid users were no more likely than light users to experience flashbacks. However, the significant correlation between marijuana use and acid flashbacks, and the evidence from the analysis of variance that acid flashback reporters used more marijuana were somewhat unexpected results. These findings were not artifacts due to overlap between acid and marijuana use, and they support Favazza's (1973) contention that subjects reporting flashbacks had probably used marijuana more frequently. Of course the correlation was not great ($r = .18$) and other factors obviously are involved in the occurrence of acid flashbacks, but the relationship is a real one which held up even when extent of acid use was controlled, i.e., partialled out. Further, this relationship was constant across different levels of acid use.

It is difficult to escape the conclusion that marijuana use is in some way functionally related to occurrence of acid flashbacks. One possibility was suggested by Favazza (1973)—marijuana "may trigger a flashback to a previous LSD experience" (p. 1399). Our data are, in fact, consistent with this contention, and could be interpreted to mean that marijuana use catalyzes the acid experience either physiologically or psychologically.

An alternative interpretation can be proposed as well. That is, that the occurrence of an acid flashback may *lead to* increased marijuana use. We might speculate that, in this case, experiencing an acid flashback is frightening or disconcerting enough to steer a person to the use of "softer"

drugs, while those who do not experience flashbacks continue to use acid at their pleasure. However, since correlational analyses do not imply direction of causality, this issue must await further investigation to be settled.

ACKNOWLEDGMENTS

The data for this study were gathered while Dr. Stanton was with the 98th Medical Detachment, U.S. Army, Vietnam. Opinions expressed herein are those of the authors and do not necessarily reflect the views of the Department of Defense.

Appreciation is extended to Dr. Robert W. Downing, Associate Professor of Psychology in Psychiatry, University of Pennsylvania, for assistance in the data analysis, and to Nancy Pollock for help in the literature review.

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