PSYCHOSOCIAL FACTORS DIFFERENTIATING MARIJUANA USERS FROM NONUSERS IN GUAM

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Research results suggest that younger, single employed males in Guam are at greater risk than others for marijuana use, and that self-reported marijuana users are significantly more likely than nonusers to indicate higher levels of psychological distress and physical complaints. Prevalence estimates for marijuana use in Guam indicate that between 8 and 14 percent of the adult population has tried marijuana. An unanticipated finding is that parents with young school children are significantly more likely than others to report ever having used marijuana. The implications of these results for future research are also discussed.

THIS RESEARCH NOTE explores the relationship between emotional well-being and self-reported marijuana use in Guam's extensive Asian-Pacific community. As Marshall, Sexton, and Insko (1994) note, previous studies focusing on pharmacologically active substances in Oceania have examined either the use of betel nut or kava, the two main precontact substances of the region (Brunton 1989; Burton-Bradley 1978; Lebot, Merlin, and Lindstrom 1992; Lindstrom 1987; Pinhey, Workman, and Borja 1992), or the use of alcohol and tobacco, the two major introduced substances in the region (Black 1984; Brott 1981; Carucci 1987; Haddon 1947; Marshall 1982, 1979; Pinhey, Workman, and Borja 1992). However, the literature reveals relatively few studies that focus on the use of illicit substances in Oceania or Micronesia, and the few studies that are available focus on marijuana use in Chuuk (Larson 1987; Marshall, Sexton, and Insko 1994; Marshall 1991, 1990)

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and in Papua New Guinea (Sterly 1979). Although concern is growing over the potential mental health effects of illegal drug use for various communities in the region (e.g., Hezel and Wylie 1992:343; Marshall, Sexton, and Insko 1994:24), there are virtually no current studies available that examine directly the potential mental health consequences of illicit substance abuse in the Western Pacific.[1] The present study addresses this issue by exploring the potential psychosocial factors that may differentiate self-reported marijuana users from nonusers in Guam. The specific goals of this brief analysis are (1) to identify the social groups in Guam that are at risk for marijuana use, (2) to determine the various psychosocial characteristics that may differentiate marijuana users from nonusers in Guam, and (3) to estimate the prevalence of marijuana use in Guam.

Background

Marijuana is the world's most widely used illegal substance, and about one in four Americans currently report having tried marijuana (National Institute on Drug Abuse 1990; U.S. Bureau of the Census 1988). Marijuana use is most frequent among those between 18 and 25 years of age, and is more popular among males than females (Robbins 1989; National Institute on Drug Abuse 1990; U.S. Bureau of the Census 1988). Some researchers argue that marijuana was introduced to the Western Pacific by Peace Corps volunteers (see Lindstrom 1987), while others note that over the past twenty-five years substance abuse in the region has grown as transportation networks improved, tourism increased, and more islanders traveled to other countries, thus gaining exposure to different lifestyles and substances (e.g., Marshall, Sexton, and Insko 1994:23). Following a decade-long decline (Bachman et al. 1988), rates of teenage marijuana use in the mainland United States have risen sharply in the past five years. More than 41 percent of last year's high-school seniors reported having tried marijuana or hashish, the highest rate since 1989 (Leland 1996). At this time, prevalence rates for marijuana use in Guam are not known.

It is generally agreed that the effects of marijuana use are not particularly dramatic: an increase in heart rate, a reddening of the eyes, a dryness in the mouth, and a disruption of short-term memory. Although the health hazards of marijuana use continue to be the subject of an emotional debate, marijuana is clearly less dangerous than alcohol, tobacco, cocaine, and most other widely used recreational drugs (Ray 1983). However, recent studies suggest that marijuana use among adolescents may contribute to subsequent psychological impairments (Hansell and White 1991), especially among those individuals characterized as being "highly introspective" (see Zablocki et al. 1991).

Research describing marijuana use in Guam's extensive Asian-Pacific community is nonexistent. However, anecdotal accounts and direct observation suggest that marijuana use in Guam is common, a conjecture that gains considerable support from the frequent newspaper accounts of attempts to smuggle marijuana onto the island from Palau and Chuuk, and from discussions with local marijuana users wherein specific kinds of marijuana (e.g., "Rota bud") are frequently mentioned. Since the present analysis is the first of its kind for Guam, it is impossible to provide a systematic assessment of the attitudes or meanings that may be associated with the use of marijuana on the island. Indeed, a secondary goal of the present study is to stimulate future research on community perspectives of substance abuse.

Methods

The primary data for this study are from the Behavioral Risk Factor Survey (BRFS) conducted in Guam between the middle of March and the end of May 1991. The BRFS used a two-stage proportional cluster design to generate a random sample of households. The sampling frame consisted of a list of the 35,277 households on the island. The relative proportion of households for each of Guam's nineteen villages to the total pool of households was calculated from the sampling frame, and a starting point within housing clusters was chosen at random. After pre-tests of questionnaire items were completed to insure agreement on the meaning of interview questions, personal interviews were conducted with either the head of household or spouse, or with the eldest dependent (18 years of age or older). If all three were present, one was chosen at random for inclusion in the study. These methods yielded a total of 398 completed interviews, for a response rate of 80.4 percent. Although the sample is relatively small, it is representative of Guam's noninstitutionalized, civilian adult residents.

Four measures are used to assess the psychosocial health characteristics of respondents. ***Psychological distress*** is a six-item short version of Langner's twenty-two-item Mental Illness Index (1962), the validity of which has been established in a number of previous studies (see Johnson and Meile 1981 for a review). High scores for this measure indicate greater psychological distress. Respondents were asked, how frequently they (1) feel worthless? (2) feel hopeless? (3) feel lonely when you are with others? (4) feel blocked? (5) have trouble remembering things? (6) feel restless? Response codes range from 0 ***(not at all)*** to 4 ***(extremely).*** Possible scores range from 0 to 24. 'The sample mean for this measure is 2.8 with a standard deviation of 3.4. An exploratory maximum likelihood factor analysis produced a single factor with

loadings of .60 or greater. The psychological distress scale shows high reliability ***(alpha =*** .819).

Personal happiness is a single item asking respondents how often they felt happy. Response codes for this item range from 0 ***(never)*** to 5 *(always).* The sample mean for personal happiness is 3.69 with a standard deviation of 1.16. Personal happiness is a frequently used measure of emotional well-being (e.g., Ellison 1991).

Somatization is an eight-item summated scale that approximates similar measures reported elsewhere (see, e.g., Conger et al. 1993). Respondents were asked how frequently they (1) had problems sleeping, (2) felt chest pains, (3) felt their mind went blank, (4) had a poor appetite, (5) felt nauseous, (6) had trouble breathing, (7) felt numbness, (8) felt weak. Response codes range from 0 ***(not at all)*** to 4 ***(extremely).*** Possible scores range from 0 to 32. An exploratory maximum likelihood factor analysis produced a single factor with loadings of .50 or greater. The somatization scale shows high reliability ***(alpha =*** ,807). The sample mean for the somatization scale is 3.3 with a standard deviation of 3.4.

Life satisfaction is a single item asking respondents to rate their overall life satisfaction with response codes ranging from 1 ***(very dissatisfied)*** to 5 ***(very satisfied).*** The sample mean for life satisfaction is 3.28 with a standard deviation of 0.76. Life satisfaction is a frequently used measure of emotional well-being (see, e.g., Ellison 1991).

Marijuana users and nonusers are distinguished with a question asking respondents to indicate whether they had ever used marijuana. Slightly more than 11 percent of the sample said they had. This item approximates measures used in similar studies (e.g., Marshall, Sexton, and Insko 1994; Zablocki et al. 1991); and, within reasonable limits, self-reports of marijuana use have come to be accepted as reliable and valid indicators of substance use (e.g., Radosevich et al. 1980). Nevertheless, self-reports of marijuana use are subject to the limitations inherent in all retrospective accounts.

Ethnicity is self-reported. Binary ethnic categories include Chamorro, Filipino, Asian (Chinese, Japanese, and Korean), Micronesian (Chuukese, Yapese, Kosraean, Pohnpeian, and Palauan), and Caucasian respondents. Additional binary variables used to assess the sociodemographic characteristics of marijuana users versus nonusers include education (those not completing high school = 1, all others = 0), total family income (those earning less than US$15,000 per year = 1, all others = 0), employment status (works full-time or part-time = 1, others = 0), marital status (married = 1, all others 0), parenthood (has young child in school = 1, others = 0), and gender females = 1, males = 0).

Following the strategy described by Zhang, Markides, and Lee (1991),

analysis of variance (ANOVA) is used to compute means for the psychosocial measures and respondents' age. Computation of binary variables (e.g., ethnicity) is performed with the same procedure, which is similar to using dummy variables in ordinary least squares regression analysis (Feldstein 1966). ***F*** tests are used to assess statistical significance.

In addition to the survey methodology described above, direct observation and informal interviews were also employed to establish a context within which to better interpret the results of the BRFS. This methodology included participation in social events where the use of marijuana was common and accepted. The use of multiple methods is often suggested when topics have previously gone unstudied, when research is exploratory, and when researchers wish to validate findings (see Denzin and Lincoln 1994).

Results

The first goal of this analysis is to identify the social characteristics of persons in Guam who are at greater risk for marijuana use than others. As shown in Table 1, individuals who report ever having used marijuana are sig-

TABLE 1. **Arithmetic Means *(x)* for Sociodemographic Characteristics of Self-Reported Marijuana Users versus Nonusers in Guam**

	Used Marijuana *(N* = 44)		Has Not Used Marijuana *(N*= 354)	
	x or %	*SD*	*x* or %	*SD*
Chamorro (%)	61.4	0.49	52.3	0.50
Filipino (%)	11.4**	0.32	31.1	0.46
Asian (%)	5.0	0.21	6.2	0.24
Micronesian (%)	11.4	0.32	6.0	0.23
White (%)	11.4	0.32	5.0	0.21
Mean age	28.9***	8.60	42.8	14.50
Female (%)	25.0***	0.44	62.1	0.48
Married (%)	41.9***	0.49	69.4	0.46
Parent (%)	45.5	0.50	38.8	0.49
$15,000 income or less (%)	26.3	0.44	39.3	0.47
Did not graduate high school (%)	20.4	0.40	24.0	0.42
Employed (%)	77.3*	0.42	59.4	0.49

Note: Readers are reminded that the arithmetic mean for binary variables may also be interpreted as the percentage of cases in non-zero categories.

* $p < .05$, ** $p < .01$, *** $p < .001$ *(F* test)

TABLE 2. Arithmetic Means *(x)* for Psychosocial Health Characteristics of Self-Reported Marijuana Users versus Nonusers in Guam

	Used Marijuana		Not Used Marijuana	
	x	*SD*	*x*	*SD*
Mean happiness	3.64	1.05	3.70	1.17
Mean distress	4.11**	3.49	2.63	3.32
Mean somatization	5.09*	4.31	3.52	3.86
Mean life satisfaction	3.16	0.71	3.30	0.76

* $p < .05$, ** $p < .01$ *(F* test)

nificantly less likely to be Filipino, a finding that essentially mirrors the results of studies describing U.S. mainland Asian-Pacific populations (e.g., Zane and Kim 1994). Also in keeping with the results of earlier studies (Umberson 1987) is the finding that marijuana users are less likely to report that they are married. Marijuana users also appear to be younger persons, males, and significantly more likely to report being employed. Again, these findings are in keeping with the results of earlier studies conducted on U.S. mainland populations (e.g., U.S. Bureau of the Census 1988) and are supported by direct observation.

Table 2 contains the results of analyses (ANOVA) examining the psychosocial characteristics of marijuana users and nonusers. As may be seen, respondents who report ever having used marijuana are significantly more likely than others to report higher levels of both psychological distress and somatization. The possibility that these bivariate associations might not retain their statistical significance when control variables were simultaneously present in the equation was also considered. In separate analyses (not shown here), logistic regression was used to reassess the relationship of the four psychosocial measures to self-reported marijuana use. Controlling for ethnicity, age, gender, marital status, parenthood, income, education, and employment status, psychological distress and somatization retained their significant associations with self-reported marijuana use. In keeping with the results presented in Table 1, the logistic regressions confirmed that younger males were significantly more likely than others to report ever having used marijuana. The logistic regression analysis also confirmed that Filipino respondents were significantly less likely than members of other ethnic groups to report marijuana use. An unanticipated finding was that respondents who reported having young children in school were significantly more likely than others to say they had used marijuana.

Finally, 11.1 percent of BRFS respondents reported ever having used marijuana. A 95 percent confidence interval (CI) was calculated to estimate Guam's rate for marijuana use (95% CI = 11.1 ± 3.1). From these figures, one can roughly estimate that somewhere between 8 and 14 percent of Guam's adult population has used marijuana.

Discussion and Conclusion

This research note makes a modest contribution to an emerging literature that describes the social distribution of mental health concerns and substance use in Guam (see Pinhey 1996; Pinhey and Ellison 1997; Pinhey, Rubinstein, and Colfax 1997). The results of analyses of BRFS data and direct observation each reveal that younger, single males are at greater risk than others for marijuana use, whereas women and Filipino respondents appear less likely than others to use the substance. In keeping with the results of earlier analyses (Umberson 1987), marriage appears to constrain marijuana use in Guam.

Marijuana users appear also to suffer greater psychological distress than nonusers and to report significantly more physical complaints. Whether or not marijuana is used by respondents to cope with psychological distress and physical symptoms cannot be discerned from the cross-sectional data analyzed in the present study. The results of more-extensive longitudinal analyses, however, indicate that marijuana use contributes to subsequent psychological impairment and physical symptoms among younger persons (see Hansell and White 1991), thus suggesting that the findings reported here may reflect the negative outcomes of previous marijuana use. Drug education programs in local high schools that are designed to reduce substance abuse may therefore also contribute to a reduction in future levels of psychological distress.

The prevalence of marijuana use in Guam is not known. However, the present study suggests that marijuana use in Guam may be significantly less than rates reported for U.S. mainland populations. Whereas approximately 25 percent of mainland U.S. residents report having used marijuana, only 11.1 percent of the BRFS respondents did so. Because the BRFS focused on adults and excluded persons under 18 years of age, the actual rate of marijuana use in Guam is probably much higher than indicated here. The validity of the present estimate is further confounded by findings showing that, whereas younger people are more likely than others to report using marijuana, the use of marijuana drops off sharply when persons reach age 35 (e.g., U.S. Bureau of the Census 1988). Separate analyses (not shown here) substantiate this general pattern for Guam. In sum, almost 29 percent of

BRFS respondents between the ages of 18 and 25 report having used marijuana, dropping to 13 percent of those aged 26 to 35 and only 5 percent of those over 35 years old. Future researchers in Guam may wish to design studies addressing substance abuse among adults and adolescents to gain more precise prevalence estimates.

The finding from the logistic regression analysis showing that parents of school-aged children were more likely than others to use marijuana is difficult to explain, and is in direct contrast with results from similar studies conducted in the U.S. mainland. For example, Umberson found that parents with young children were significantly less likely than others to report using marijuana, to have drinking problems, or to drive after drinking (1987). One possible explanation may be that the parenthood measure used in the present study (having a young child in school) actually indicates the younger age of respondents who report being parents. The significant association between having a young child in school and self-reports of marijuana use found in the present analysis deserves additional study.

The potential limitations of the present analysis should be mentioned. First, the BRFS sample is relatively small. Larger samples may produce results different from those presented here. Second, the BRFS measure for marijuana use is for those who have *ever* used the substance. Measures assessing the frequency of marijuana use, the length of time that individuals have regularly used marijuana, current use of marijuana, and other similar measures may provide the means for more accurate and extensive analyses. Finally, the BRFS is cross-sectional, and thus does not allow for analyses addressing the question of which came first, marijuana use or psychological distress. The answer to this question for Guam awaits the generation of longitudinal data. These potential limitations aside, the present analysis extends our understanding of the psychosocial health profile of marijuana users in Guam, and contributes to our knowledge of a major health concern for Guam's rapidly growing and little-studied population. Future researchers are strongly urged to more thoroughly examine the relationship of substance abuse to mental health in Guam and Micronesia (e.g., Hezel and Wylie 1992), and to participate in the development of community-based substance-abuse prevention programs.

NOTE

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1. Other researchers note that concern with marijuana use is particularly evident in Guam, where "ice" and heroin are also problematic (Marshall, Sexton, and Insko 1994: 24). Moreover, drug-related issues in Guam are not restricted to mental health problems alone: among other concerns are the various criminal activities associated with drug smuggling and with other crimes committed by drug users themselves. These authors also discuss the acknowledgement of drug-related problems in Micronesia by the World Health Organization's Regional Office for the Western Pacific. The office has funded several short-term consultancies and convened two conferences focusing on drug-related problems in the region, one held in Palau (June 1989) and the other in Pohnpei (August 1993). The direct involvement of the Federated States of Micronesia government in the Pohnpei conference is described by Marshall and colleagues as a "significant marker of growing concern" in the region over substance abuse (ibid.).

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