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**The Relationship of Sensation Seeking,
Hostility, and Childhood Hyperactivity
to Multiple Location Drinking
Among DWI Offenders**

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ACQUISITION

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ABSTRACT

Our previous research has found that, compared to DWI offenders who drank at only one location, DWI offenders who drank at multiple locations exhibited a constellation of problem behaviors including heavier drinking, driving while impaired more frequently, and a higher probability of a diagnosis of alcohol dependence. The purpose of this paper is to examine personality characteristics which may help explain the reasons for multi-location drinking. Is multiple location drinking significantly associated with sensation seeking, hostility, or childhood hyperactivity? The sample (n=190) consists of first and repeat drinking and driving (DWI) offenders. Zuckerman's Sensation Seeking Scale (SSS), the Buss-Durkee Hostility Inventory (BDI), and three scales (Hyperactivity, Attention/ Socialization, Antisocial) based on Tarter's childhood hyperactivity checklist were measured. DSM-III-R alcohol dependence criteria were assessed by a self-administered questionnaire based on the DIS. No significant differences for demographic variables (sex, age, income, race, marital status) were found between the two groups. Univariate analysis of variance showed that multi-location drinkers significantly differed ($p < .05$) from single location drinkers on 4 of 5 sensation seeking subscales, on 4 of 8 hostility subscales, and on 2 of the 3 hyperactivity scales. These findings indicate that the multi-location drinkers were greater sensation seekers, were more hostile, and reported more hyperactivity symptoms than did the single location drinkers. Stepwise discriminant function analysis (DFA) was used to simultaneously examine the ability of the personality measures to distinguish between the two groups. The DFA found only two scales that significantly differentiated between the groups: the boredom susceptibility scale from the SSS and the verbal hostility scale of the BDI. However, when the level of alcohol dependence was controlled for in the DFA, only the boredom susceptibility scale made a significant contribution to the function. These findings suggest that multiple location drinkers tend to be sensation seekers, which helps to explain their risky behavior. Treatment providers need to consider the sensation seeking propensities of multiple location drinkers when formulating interventions for DWI offenders. (Supported by the National Highway Traffic Safety Administration.)

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INTRODUCTION

The issue of multiple location drinking has received little attention outside of the general idea that alcoholics tend to drink as often and in as many places as possible. . Research is sparse on factors associated with multiple versus single location drinking, although the number of drinking locations during a single drinking episode may provide important insights into the association of social context with drinking patterns and problems (Wieczorek et al., in press). In addition, multiple location drinking is an especially relevant topic for DWI offenders since most of them are driving from one location to the next, which results in increased exposure to alcohol-related crashes and fatalities. Our previous research found that in a sample of 461 DWI offenders referred for alcoholism evaluation, those who drank at multiple locations exhibited a much more severe constellation of problem behaviors than found for the single location drinkers (Wieczorek et al., in press). Compared to the single location drinkers, the multi-location drinkers consumed a greater quantity of alcohol, reported a greater number of alcohol-related problems, were more likely to receive an alcohol dependence diagnosis, had more bad driving incidents, and more frequently drove after drinking. The association of a constellation of problem behaviors with multi-location drinking among DWI offenders was replicated on a more general sample of 374 DWI offenders (Wieczorek et al., 1991).

This paper examines personality and behavioral background variables in an effort to better understand multiple location drinking by DWI offenders. The measure of multiple versus single location drinking is based on the offenders' reported usual drinking practices because a report for a single drinking episode could be non-representative of the individual's typical behavior. The differences between single location drinkers and multiple location drinkers are

examined for three measures: sensation seeking, hostility, and childhood behaviors associated with minimal brain dysfunction/hyperkinesis.

Sensation seeking is a trait defined by the demand for varied, novel, intense, and complex sensations/experiences and the intention to take risks to achieve such experiences (Zuckerman, 1990). Thus, differences in sensation seeking could be partially responsible for a behavior such as multiple location drinking. Multiple drinking settings during a single drinking event may help satisfy a sensation seeking individual's need to experience different physical and social settings. Past research has linked sensation seeking with alcohol and drug use (Andrucci et al. 1989), high-speed driving (Zuckerman and Neeb, 1980), adolescent drunk driving (Arnett, 1990), sexual experiences, cigarette smoking, music preferences, and volunteering for experiments (see Zuckerman, 1983 for a full review).

A person's hostility level may be associated with multiple location drinking for two reasons. First, hostile individuals are likely to have difficulty developing and maintaining interpersonal relationships in a social context such as a drinking setting. The lack of meaningful interpersonal contact could create an uncomfortable situation which the hostile individual may leave for a different drinking location. Second, an overtly hostile person could become an unwelcome addition to a drinking setting and may be asked or forced to leave and find someplace else to drink. Also, hostility has been related to the presence and severity of drug and alcohol diagnoses (Walter et al., 1990), as well as associated with aggressive driving tendencies among DWI offenders (Donovan and Marlatt, 1982).

Childhood hyperactivity/minimal brain dysfunction (HK/MBD) was examined to see whether HK/MBD problems continue into adulthood and act as an underlying

catalyst for such behaviors as multiple location drinking. Hyperactivity may act similarly to sensation seeking leading to the need for varied social contexts. The antisocial behavior and socialization problems associated with HK/MBD may make it difficult to integrate into any one drinking setting resulting in a tendency for multiple location drinking by HK/MBD individuals who want to drink. In addition, HK/MBD is associated with alcoholism, especially early onset (Tarter et al. 1977) and with other problem/deviant behaviors (Windle, 1990).

This research studied 190 convicted drinking and driving offenders to examine these research questions: (1) Is sensation seeking a factor in multiple location drinking among DWI offenders; (2) Does hostility significantly differentiate between single and multiple location drinkers; and (3) Does a history of childhood HK/MBD problems suggest a long-term linkage with multiple location drinking?

METHOD

The sample consists of 190 DWI offenders (i.e., persons convicted of any drinking and driving offense) obtained during July through November 1989 in Erie and Nassau Counties, New York. Subjects were recruited from the Erie and Nassau County Probation Departments and from the Drinking Driver Program in Erie County. First (44%) and repeat (56%) DWI offenders, based on official Department of Motor Vehicles' records, are included in the sample. According to New York State Department of Criminal Justice Services records for 1988, our sample of 86% male and 87% white is similar to the gender (89% male) and race (90% white) composition of the 67,575 arrests across the state. However, about 18% of our sample was under 25 years of age compared to the statewide figure of 28% under age 25. This difference is the result of the high proportion of repeat offenders

in our sample.

The subjects provided signed consent on forms which explained the confidentiality of their responses and completed questionnaires assessing demographics, drinking-related items, and personality/behavioral measures. DSM-III-R alcohol dependence criteria (APA, 1987) were assessed by items from the Diagnostic Interview Schedule (Robins et al., 1989) adapted for self-administration. The question "When you go out to drink, about how many different places do you drink at?" was used to categorize the DWI offenders into single and multiple location drinkers.

Sensation Seeking Scale: The 72-item sensation seeking scale (SSS) form IV has been widely used and validated (Zuckerman, 1979). The SSS consists of the following scales:

- General Sensation Seeking: Overall measure of propensity for varied experiences/sensations.
- Thrill and Adventure Seeking: Reflects desired involvement in physical activities relating to novelty, speed, and danger.
- Experience Seeking: Reflects proclivity towards seeking varied experiences through art, travel, music, and non-conforming lifestyles.
- Disinhibition: Measures release of inhibition through substance use, sex, and partying.
- Boredom Susceptibility: Reflects aversion to repetitive experiences, boring people, and routine work.

The Buss-Durkee Hostility Inventory (BDI) is a 75 item self-administered measure consisting of the following scales (Buss and Durkee, 1957):

- Assault: Tendency towards physical violence against people.
- Indirect Hostility: Activity relating to undirected aggression (e.g.,

temper tantrums) and indirect attacks on others (e.g., gossip or practical jokes).

- Irritability: Inclination to erupt with rudeness or grouchiness at minor annoyance.
- Negativism: Uncooperative attitude, especially towards authority.
- Resentment: Jealousy and dislike of others.
- Suspicion: Ranges from a distrust of others to the belief that others are plotting to cause harm.
- Verbal Hostility: Tendency towards verbal expression of disapproval and dislikes including shouting, arguing, and verbal threats.
- Guilt: Measures remorse and negative emotions pertaining to misbehavior.

The HK/MBD checklist is a retrospective measure of behaviors occurring before age 12 (Tarter et al., 1977). The HK/MBD scales used in this study are the three scales found by Sher and Alterman (1988) which strongly replicated three of the four factors originally derived by Alterman and McLellan (1986). These scales are:

- Hyperactivity: Based on such behaviors as impulsive, fidgets, can't sit still, and overactive.
- Attention/Social Problems: Includes reports of feeling left out, not completing projects, easily frustrated, doesn't follow directions.
- Antisocial Behavior: Includes such behaviors as lying, stealing, fighting, and vandalism.

RESULTS

The sample was split almost evenly between those who usually drink at a single location (51%), and those who drink at multiple locations (49%). No significant demographic differences between the single and multi-location drinkers were found. The DWI offenders were mostly males (86%), white (87%), currently employed (81%), and had an average age of 33.9 ($SD \pm 9.3$) years. About 88% of the sample had at least a high school education, 46% were never married, and the average total household income was \$31,654 ($SD \pm \$25,143$).

Table 1 shows the results of the comparison between the single and multi-location drinkers on the Sensation Seeking Scale (SSS). Significant differences on four of the five scales indicate that the multiple location drinkers are greater sensation seekers than the single location drinkers. The findings suggest that the groups have a similar tendency towards disinhibited behavior (see disinhibition scale). However, the multi-location group showed a greater interest in physical thrills and danger (thrill and adventure seeking scale), more interest in varied cultural experiences (experience seeking scale), and a tendency to become more easily bored (boredom susceptibility scale) than the single location drinkers.

The results of comparing the single and multi-location groups on the Buss-Durkee Hostility Inventory (BDI) are presented in Table 2. The multiple and single location groups differed significantly on four of the eight BDI scales. The multiple location drinkers scored significantly higher than the single location drinkers on the assault, suspicion, verbal hostility, and guilt scales. The multiple location drinkers appear to be more physically hostile, distrustful, argumentative, and remorseful than the single location drinkers. Differences between the two groups based on childhood HK/MBD behaviors are shown in Table 3.

The multiple and single location drinkers differed significantly on two of the three scales: hyperactivity and antisocial behavior. Thus, the multi-location drinkers were more overactive and reported more deviant behavior (e.g., lying, stealing, vandalism) during childhood than the single location drinkers.

Discriminant Function Analysis: Discriminant function analysis (DFA) was used to examine the multivariate relationships between the number of drinking locations and the measures of sensation seeking, hostility, and HK/MBD. The DFAs were run in a stepwise manner which selected the variables that best differentiated between the single and multiple location drinkers based on minimizing Wilks' lambda. The .05 level of significance was used to determine inclusion or exclusion of variables in the discriminant function.

The first DFA examined the ability of the 10 scales that were significant in the univariate ANOVA to distinguish between the two groups of drinkers. Table 4 shows the final results of the DFA. The boredom susceptibility scale was selected for entry on the first step. After the entry of the boredom susceptibility scale, only the assault, suspicion, verbal hostility, and guilt scales of the BDI, and the HK/MBD antisocial scale would have made a significant contribution to the DFA. The verbal hostility scale was next entered into the DFA because it best met the inclusion criterion (minimization of Wilks' lambda). No other scales made a significant contribution to the DFA after entering the verbal hostility scale. Thus, the DFA clarified the univariate ANOVA findings for sensation seeking and hostility: the multi-location drinkers tend to become easily bored and are more likely to express verbal hostility than single location drinkers. However, after accounting for the current measures of sensation seeking and verbal hostility, childhood HK/MBD behaviors are not significant.

A DFA examining sensation seeking, hostility, and HK/MBD, while controlling

for alcohol dependence was performed because our previous research on DWI offenders found significant differences in alcohol dependence between single and multiple location drinkers (Wieczorek et al., 1989, 1991, in press). In this sample about 89% of the multiple location drinkers and 58% of the single location drinkers met the criteria for DSM-III-R alcohol dependence. The mean number of DSM-III-R dependence criteria differed significantly ($F=27.63$, $p<.0001$) between the single location ($\bar{x}=3.88\pm2.89$) and multiple location ($\bar{x}=6.00\pm2.50$) groups. The number of DSM-III-R dependence criteria present was forced into the DFA at the first step to control for differences in alcohol dependence (see Table 5). Only three scales, general sensation seeking, thrill and adventure seeking and boredom susceptibility from the SSS, could significantly distinguish between DWI offenders who drink at single and multiple locations. The boredom susceptibility scale was selected at the next step for entry into the DFA. After this step, no other scales met the significance criterion for entry into the DFA.

The second DFA provides a clearer picture of the univariate results and of the first DFA. Much of the difference between single and multiple location drinkers on the hostility and HK/MBD measures is accounted for by differences in alcohol dependence, whereas even after accounting for alcohol dependence sensation seeking can still significantly distinguish between the two groups.

DISCUSSION

The univariate analyses of the sensation seeking, hostility, and HK/MBD measures showed significant differences between the single and multiple location drinking groups of DWI offenders. The differences suggested that the multiple location drinkers were greater sensation seekers (4 of 5 scales), more hostile (4 of 8 scales), and reported more childhood HK/MBD problems (2 of 3 scales).

The multivariate DFA showed that only a few scales (boredom susceptibility, verbal hostility) accounted for the significant difference between the multiple and single location drinkers. Finally, when alcohol dependence was controlled for in the DFA and boredom susceptibility of the SSS was entered, other personality and childhood behavior scales were not significant. These results suggest that alcohol dependence and sensation seeking, particularly boredom susceptibility, are important factors for explaining the differences between first and multi-location drinking among DWI offenders.

Thus, the major conclusion of this study is that sensation seeking significantly contributes to the behavior of multiple location drinking, even when controlling for alcohol dependence. The boredom susceptibility scale is particularly appropriate because this scale reflects an aversion to repetitive experiences. These findings suggest that multiple location drinkers are more likely to become bored with their surroundings, and, therefore, are likely to attempt to seek out different and more exciting places to drink at. However, a more general propensity toward sensation seeking is likely among the multi-location drinking group of DWI offenders because of the correlation between sensation seeking scales reported by Zuckerman (1979) and also present in this study (correlations with other SSS range from .32 to .57).

These findings indicate that sensation seeking propensities may need consideration when treating or intervening with DWI offenders, particularly those who typically drink at multiple locations during a single drinking episode. Efforts to deal with sensation seeking are needed in addition to interventions directed at the alcohol dependence. Future research to examine what types of interventions directed at sensation seeking would be useful. For example, should an effort be made to decrease sensation seeking activities, which is likely to

fail since sensation seeking appears to be a biologically determined trait (Zuckerman, 1990)? Should less harmful forms of sensation seeking experiences be encouraged to replace the more harmful activities (e.g., multiple location drinking, drinking and driving)? Will participation in socially sanctioned sensation seeking activities (e.g., sports, scuba diving, hiking/climbing) lead to a reduction in deviant sensation seeking behaviors (e.g., substance abuse)? What other social and physical activities can meet the need for stimulation characteristic of sensation seekers? Certain types of sensation seekers, such as those DWI offenders who are multiple location drinkers, may respond better to specific types of stimulating activities (Zuckerman, 1980). What are those activities? Research is needed to examine these questions.

In addition, an important public policy question is for whom harm minimization is a more appropriate goal rather than zero tolerance when attempting to minimize the negative public health impact of behavior such as multiple location drinking by DWI offenders. Further, zero tolerance for behaviors driven by an underlying personality trait like sensation seeking may be difficult to attain. Recently, Marlatt (Marlatt and Forseth, 1991) pointed out that American society needs to examine what risk-taking opportunities are available and attempt to channel this energy away from such behaviors as gang membership, mass media violence, and substance abuse. To do so will require an effort to identify stimulating social and physical activities, including efforts to minimize the negative social impacts of such behavior as multi-location drinking while recognizing that this behavior is likely to continue. A campaign based on the "Just say No!" concept is unlikely to eliminate behaviors associated with traits like sensation seeking, hyperactivity, or hostility. Future efforts to compare the public health outcomes based on either a harm minimization or zero

tolerance model are needed to add scientific rigor and evidence to the policy debate.

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Table 1

Sensation Seeking of Single and Multiple Location Drinking DWI Offenders.

Usual Number of Drinking Locations

Sensation Seeking Scales	Single (Mean \pm SD)	Multiple (Mean \pm SD)	F	ANOVA Significance
General SS	8.20 \pm 3.75	9.94 \pm 4.31	7.73	.006
Thrill & Adventure Seeking	8.00 \pm 3.34	9.51 \pm 3.58	7.82	.006
Experience Seeking	5.31 \pm 2.77	6.72 \pm 3.19	8.66	.004
Disinhibition	4.25 \pm 2.49	4.83 \pm 3.13	1.62	.20
Boredom Susceptibility	4.78 \pm 2.57	6.31 \pm 3.00	12.12	.0006

Table 2

Hostility of Single and Multiple Location Drinking DWI Offenders

Usual Number of Drinking Locations

Buss-Durkee Scales	Single (Mean \pm SD)	Multiple (Mean \pm SD)	F	ANOVA Significance
Assault	3.81 \pm 1.76	4.48 \pm 1.92	5.49	.02
Indirect Hostility	3.44 \pm 1.50	3.71 \pm 1.67	1.19	.28
Irritability	4.65 \pm 2.08	5.14 \pm 1.77	2.74	.10
Negativism	2.01 \pm 1.38	2.26 \pm 1.43	1.31	.25
Resentment	2.94 \pm 1.97	3.45 \pm 1.79	3.19	.08
Suspicion	3.81 \pm 2.04	4.75 \pm 1.87	9.70	.002
Verbal Hostility	5.65 \pm 1.84	6.49 \pm 1.93	8.53	.004
Guilt	4.00 \pm 2.29	4.96 \pm 2.44	7.06	.009

Table 3

Childhood HK/MBD Problems of Single and Multiple Location Drinking DWI Offenders

Usual Number of Drinking Locations

HK/MBD Scales	Single (Mean \pm SD)	Multiple (Mean \pm SD)	F	ANOVA Significance
Hyperactivity	3.04 \pm 2.97	4.65 \pm 3.42	10.85	.0001
Attention/Social Problems	2.07 \pm 2.21	2.61 \pm 2.38	2.40	.12
Antisocial Behavior	.89 \pm 1.34	1.59 \pm 1.41	11.36	.0009

Table 4

Discriminant Function Analysis of Single and Multiple Location Drinking DWI Offenders Using Sensation Seeking, Hostility, and HK/MBD Predictors

Predictor	Standardized Coefficient	Significance of F-to-remove	Wilks' Lambda	Characteristic Associated w/ Multiple Location Drinking
Boredom Susceptibility	.76	.0006	.902	Easily bored
Verbal Hostility	.62	.005	.844	Verbally Abusive

Significance of function $\chi^2=21.08$ df=2 p=.0001

Table 5**Discriminant Function Analysis of Single and Multiple
Location Drinking DWI Offenders Controlling for Alcohol
Dependence**

Predictor	Standardized Coefficient	Significance of F-to-remove	Wilks' Lambda	Characteristic Associated w/ Multiple Location Drinking
# of DSM-III-R Alcohol Dependence Criteria	.77	.0001	.839	More dependence symptoms
Boredom Susceptibility	.50	.01	.798	Easily bored

Significance of function $\chi^2=29.13$ $df=2$ $p<.0001$