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# Alcohol Consumption Among Hospitality Students and Hospitality Employees: A Replication and Pilot Study

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**Alcohol Consumption Among Hospitality Students and Hospitality Employees:  
A Replication and Pilot Study**

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**ABSTRACT**

This is a descriptive study that investigates alcohol consumption among hospitality students and hospitality employees. Based on prior research conducted in Scandinavia and the United States, comparisons are made to other non-hospitality majors as well as those employed in non-hospitality industries. In a general sense the claim that hospitality students and hospitality employees consume alcohol at higher rates than students and employees with different affiliations is confirmed. Explanations for the disparate alcohol consumption are proposed.

**Key Words:** Alcohol consumption, AUDIT, hospitality, university students.

**INTRODUCTION**

The claim is frequently made that hospitality business students and hospitality employees consume alcohol at higher rates than students and employees with different affiliations. There is some empirical support for this assertion (Kjærheim, Mykletun, Aasland, Haldorsen & Andersen, 1995; Kjærheim, Mykletun & Haldorsen, 1996; Kouvonen & Lintonen, 2002; Larsen, 1994; Larsen & Jørgensen, 2003). The locus of the hospitality specific research appears to be Scandinavia. University students in the US also consume alcohol - often at high levels with negative consequences (NIH, 2007; Hingson, Heeren, Zakocs, Kopstein & Wechsler, 2002; Knight, Wechsler, Kuo, Seibring, Weitzman and Schuckit, 2002; Singleton, 2007). The US research to date has not focused specifically on hospitality sub populations. One of the unanswered questions is, can the findings among the Scandinavian samples transverse cultures and be replicated on a hospitality student and hospitality employee populations in the US? Additionally, are the alcohol consumption levels among hospitality students and hospitality employees consistent with levels reported among university students and hospitality industry employees in the US?

To measure alcohol consumption, AUDIT, the Alcohol Use Disorders Identification Test, (Babor, Higgins-Biddle, Saunders & Monteiro, 2001) is used. It was used by Larsen and colleagues (Fleming, Barry and MacDonald, 1991; Larsen, 1994; Larsen & Jørgensen, 2003), and will therefore aid the replicative nature of this study. Furthermore, AUDIT is a reliable and valid measure that has been found to have high degree of specificity and sensitivity in diagnosing at-risk, harmful and hazardous drinking among college and non-college populations

that have not been previously diagnosed as excessive drinkers or alcohol dependent (Allen, Litten, Fertig & Babor, 1997; Babor, et al., 2001; Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998; Fiellin, Reid & O'Connor, 2000; Fleming, Barry & MacDonald, 1991; Saunders, Aasland, Amundsen & Grant, 1993). Finally, AUDIT was chosen for this study over other measures of alcohol consumption, such as those offered by the American Psychiatric Association (1980, 1987, and 1994) because AUDIT provides a self-report measure of risk rather than a counselor established current diagnosis.

The AUDIT produces a total score that ranges from 0-40 with a total score of 8 or more indicating hazardous and harmful alcohol use. Specifically, Babor et al. (2001) identify four risk-level zones and suggest an associated intervention: An AUDIT score of 0-7 is Low Risk Drinking or Abstinence and subjects with this score should receive general alcohol education; an AUDIT score of 8 through 15 represent a medium level of alcohol risk and subjects in this range should receive simple advice focused on the reduction of hazardous drinking; subjects that obtain AUDIT scores between 16 and 19 are at high risk and should receive alcohol reduction advice combined with brief counseling and continued monitoring; AUDIT scores in the 20-40 range indicate subjects at very high risk of hazardous and harmful alcohol consumption, and should be referred to specialists for diagnostic evaluation and potential treatment. The AUDIT contains three subscales that can be interpreted independently, viz., hazardous alcohol use (0-12), dependence symptoms (0-12), and harmful alcohol use (0-16). Hazardous use points to future risk, while harmful use taps the degree to which alcohol related harm is already being experienced.

### **THE SCANDIVIAN CONSUMPTION DATA**

Larsen (1994) mentions that although many state and believe that hospitality employees consume more alcohol than other service industry employees, the problem is given little attention in the hospitality trade and research literatures. He also points out that service quality may suffer as a consequence of alcohol consumption among service employees.

College Students. Eighty-four students from Stavanger University participated in Larsen's (1994) research. The sample consisted of 37 respondents from the Norwegian College of Hotel Management, 25 respondents from the College of Education and 22 respondents from other colleges. He reports AUDIT scores of 7.85 for Food and Beverage Majors, 7.67 for Lodging Majors, 2.28 for Education Majors, and 6.82 from other majors ( $F(3,80)=8,961, p<.01.$ ).

In a subsequent study, Larsen and Jørgensen (2003) investigated the alcohol consumption of tourism majors (n=29), hotel management majors (n=60), and other majors (n=87), and found AUDIT scores of 7.57, 7.93, and 6.70, respectively. They report an overall mean AUDIT at 7.27 and that 35.5 percent of respondents scored 8 or higher on the AUDIT. The differences in AUDIT scores were not statistically significant.

Service Industry Employees. A total of 105 service industry employees participated in Larsen's (1994) research. They worked in restaurants (n=14), lodging operations (n=52), bank and insurance companies (n=11), and at gas stations (n=28). The reported AUDIT scores are 8.14, 4.58, 4.21 and 4.09, respectively ( $F(3,101) 4.239, p<.01$ ). Kjærheim et al. (1995) reported on alcohol consumption among 3,267 waiters and cooks. They report quantity and frequency of alcohol consumption and classified 6.0 percent of the men and 5.8 percent of the women as heavy drinkers, while 6.0 percent of the men and 4.4 percent of the women were classified as non-drinkers. Kouvonen and Lintonen (2002) investigated alcohol consumption among 47,568 Finnish youth aged 14-16 to explore the relationship between part-time work and heavy drinking. Youth that were employed for more than 10 hours per week were at greater risk of heavy drinking than those that worked less. Work intensity was also a risk

factor. Respondents in some jobs, such as working in fast food or other restaurant work ( $n=249$ ,  $p<.08$ ) and working in packing or stock work ( $n=299$ ,  $p<.01$ ) were at greater risk of heavy drinking than the remainder of their respondents. They note that 52 percent of adolescents working in fast food restaurants suggested they “got really drunk” monthly while only about half as many employed in other work reported drinking at that level.

### THE US CONSUMPTION DATA

Unlike the Scandinavian sample, the US college sample does not specifically include or identify hospitality majors and the consumption data on service industry employees comes from broad occupational studies rather than from studies collected specifically to investigate service industry employee alcohol consumption.

College Students. On a sample of 989 undergraduate college students, Fleming, Barry and MacDonald (1991) report that 29 percent met criteria for alcohol misuse. Among those that misused alcohol, 92 percent reported having one or more blackouts and 49 percent said their families objected to their drinking. They report a mean AUDIT score of 9<sup>1</sup>, and report further that 25 percent drank more than 6 drinks on a single occasion at least once per week, 15 percent were involved in an injury during drinking, 12 percent reported monthly or more frequent black-outs, 12 percent had received advice to cut down or eliminate drinking, 10 percent felt guilty about drinking at least monthly, 4 percent could not stop drinking once they started, 2 percent failed to fulfill responsibilities due to drinking and less than 1 percent needed a weekly or more frequent eye-opener, i.e., an alcoholic beverage in order to feel better.

Knight et al. (2002) report on alcohol consumption among 14,115 undergraduate college students. They used the alcohol abuse and alcohol dependence criteria of the American Psychiatric Association (1994) Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). They diagnosed 31.6 percent of the students as alcohol abusers, while 6.3 percent were alcohol dependent and 62.2 percent were diagnosed as neither. Considering all diagnostic criteria, 44.1 percent of the student population experienced one or more abuse or dependence symptoms.

Presley and Pimentel (2006) introduced the category of heavy and frequent drinker, and in a study of 28,774 undergraduate students reported that 73.6 percent of the students drink alcohol, of which the majority (59.1%) consumed low levels of alcohol, defined as less than five drinks on a single occasion, and was classified as “non-heavy drinkers”. About 41 percent (40.9%) consumed 5 or more drinks on a single occasion and were classified as “heavy drinkers.” Among the “heavy drinkers,” 37.6 percent would drink on three or more occasions every week, and were classified as “heavy and frequent drinkers.” The “heavy and frequent drinkers” were 15.4 percent of all drinkers, or 11.3 percent of the total sample.

Service Industry Employees. In a study of 11,789 adults, Mandell, Eaton, Anthony and Garrison (1992) considered the occurrence of alcohol abuse or alcohol dependence across 104 occupations. Waiters and waitresses ( $n=154$ ), cooks ( $n=149$ ) other food preparation employees ( $n=191$ ) and other service occupations ( $n=117$ ) were included. They used the American Psychiatric Association’s (1980) Diagnostic and Statistics Manual of Mental Disorders and the associated Diagnostic Interview Schedule known as DIS/DSM-III, which suggests a general population crude prevalence rate of 6.48 for alcohol abuse or dependence. While Mandell et al. (1992) report 10 occupations with a crude prevalence rate twice the population rate, the crude prevalence rates for waiters and

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<sup>1</sup> The version of AUDIT they used allowed for a maximum score of 41. Current versions have a maximum score of 40. As such it may be acceptable to view their score of 9 as a rough approximation of 8 on the current version of AUDIT.

waitresses (8.44), cooks (5.37) other food preparation employees (6.81) and other service occupations (2.56), were markedly lower. With the exception of other service occupations, which were mostly occupied by women, the crude prevalence rate for men was much higher than the crude prevalence rate for women across all occupations. They report further that waiters and waitresses when unadjusted for socio-demographic characteristics did not have significantly elevated odds of alcohol use and abuse ( $OR=1.3$ ), but when controlled for age, race, sex and education they were more likely to suffer from alcohol use and abuse ( $OR=2.4$ ), and that those currently employed as waiters and waitresses had an elevated odds ratio ( $OR=4.5$ ) while those no longer employed returned to a non-significant odds ratio ( $OR=1.3$ ). The equivalent odds ratios for other service occupations were, 0.4, 0.6, 0.0, and 1.5, respectively.

Parker and Harford (1992) investigated alcohol use and alcohol dependence across the occupations of 26,738 employed subjects 18 years and older, using a revised edition of the American Psychiatric Association DSM-III manual (1987). Bartenders had the highest level of daily alcohol consumption, with 35.2 grams of ethanol for male bartenders and 33.7 grams of ethanol for female bartenders, while waiters consumed 17.9 grams of ethanol daily and waitresses consumed 11.0 daily grams of ethanol. The food service worker category was also among the highest in alcohol dependence. About 38 percent (37.6%) of the male bartenders were classified as alcohol dependent while 15 percent were classified as severely alcohol dependent; 6.2 percent of the waitresses were identified as alcohol dependent and 2 percent as severely alcohol dependent.

Stinson, DeBaakey and Steffens (1992) found the highest dependence and abuse among bartenders (42.19%,  $SE=6.05$ ) with male bartenders' prevalence of dependence and abuse at 50.75 percent ( $SE=8.79$ ) and female bartenders' dependence and abuse at 34.61 percent ( $SE=8.33$ ). Waiters and waitresses had a combined prevalence of 17.14 percent ( $SE=2.16$ ). When separated the men had a higher prevalence with waiters at 26.24 percent ( $SE=6.83$ ) and waitresses at 15.23 percent ( $SE=2.29$ ).

In a study ( $N=7055$ ) of binge drinking among adults in North Dakota (Jarman, Naimi, Pickard, Daley & De, 2007), food or drink servers had the second highest prevalence in the state. About twenty percent reported binge drinking, with the employed prevalence at 24.1 percent and the non-employed prevalence at 10.8 percent. The prevalence of binge drinking among food and drink servers was 33.4% ( $95\% CI=23.9-44.4$ ); when controlled for age and gender it was 28.5% ( $95\% CI=19.6-39.5$ ). The crude odds of binge drinking for food and drink servers were 3.3 ( $95\% CI=1.9-5.7$ ), and when controlled for marital status, gender, age, annual income and education 2.1 ( $95\% CI=1.1-4.0$ ). The reference OR was 1.0 for health care workers, who had the lowest prevalence of binge drinking in this study with 13.2% ( $95\% CI=10.3-16.8$ ) and 14.4% ( $95\% CI=10.9-18.7$ ), respectively.

Corsun and Young (1998) set out to identify alcohol consumption levels and predictors of such among managers of hospitality businesses ( $N=183$ ). Measuring drinking frequency and heavy drinking frequency, the latter is defined as three or more drinks on any one occasion, they found that those working in hospitality drank more frequently than those working elsewhere, but the difference was non-significant,  $t(157)=1.63$ ,  $p>.05$ . Men in their sample both drank more frequently,  $t(157)=4.42$ ,  $p<.01$ , and engaged in heavy drinking more often,  $t(88)=2.45$ ,  $p<.01$ , than their women counterparts. Finally, they expected to find a negative association between age and alcohol consumption frequency, but found the opposite ( $r=.35$ ,  $p<.01$ ).

## RESEARCH QUESTIONS

It is often claimed that hospitality students and hospitality employees consume alcohol at higher rates than students and employees with different affiliations. It is by no means certain that the seminal research with a Scandinavian locus is relevant in the US, nor is it certain that hospitality students drink more than other students, nor is it certain that those in hospitality occupations drink more than those in other occupations. An attempt will be made to start establishing whether that is the case or not, with a *pilot study* of students at large university in the US. The following questions are posed:

### Research Questions

- RQ1: Do hospitality students consume alcohol at levels consistent with those reported in previous studies of Scandinavian students?
- RQ2: Do hospitality students consume alcohol at higher levels than that of other student majors?
- RQ3: Do employees of hospitality businesses consume alcohol at levels consistent with those reported in previous studies of Scandinavian students?
- RQ4: Do employees of hospitality businesses consume alcohol at higher levels than that of those in other occupations?
- RQ5: Are there occupations within hospitality businesses that consume alcohol at higher levels than hospitality business employees at large?
- RQ6: Are there occupations among non-hospitality employees that consume alcohol at higher levels than non-hospitality business employees at large?
- RQ7: Are demographic variables such as gender and age associated with different levels of alcohol consumption?

## METHODS

The Office for Survey Research at the Institute for Public Policy and Social Research at Michigan State University collected the needed data. They generated random email lists of students to whom they sent a notice of a forthcoming study, requesting participation. Approximately one week after the notice, a link to the actual survey was included as well as notice of a choice of incentives for completion. The incentives included coupons for such items as free pizza or ice-cream. Approximately, two weeks after the initial mailing, a reminder was sent to the students. The OSR continued to solicit participants until the hospitality major sub-sample size was large enough to detect small AUDIT effect sizes ( $f=.10$ ) at the conventional power level of .80 (Cohen, 1988). The students were provided confidentiality. The response rate among solicited students is 43.3 percent. A total of 2148 students were asked to participate.

## SAMPLE

Of 930 participating students, 331 (35.6%) were male and 552 (59.4%) were female. Forty-seven subjects (5.1%) did not disclose gender while forty-three subjects (4.6%) did not report their age. Age ranged from 18 years to 30 years ( $\bar{x}=21.2$ ,  $SD=2.2$ ) among the 887 that reported age. Ninety-six percent ( $n=890$ ) disclosed their major; 262 students were hospitality students while 628 reported a different major. The average semester credit hours are 13.3 ( $\bar{x}=14$ ,  $SD=3.0$ ,  $n=896$ ). Sixty-four percent (64.1%,  $n=596$ ) are employed, of which 30 percent work in hospitality businesses. About 6 percent (5.6%) work 40 or more hours per week, while 3.3 percent work 30-39 hours, 16.8 percent work 20-29 hours, 28.8 percent work 10-19 hours, and 9.2 percent work less than 10 hours per week. Finally, it is important to note that 27 percent of hospitality majors did not work in hospitality businesses and that 16 percent of other-majors reported working in hospitality businesses.

**RESULTS**

The total AUDIT score for the sample is 6.70 ( $N=813$ ,  $SD=5.57$ ) and the highest frequency of alcohol consumption was 2-3 times per week reported by 7.3 percent of the sample. The total AUDIT score for hospitality majors is 7.81 ( $n=241$ ,  $SD=5.78$ ) and for other majors it is 6.23 ( $n=572$ ,  $SD=5.41$ ). The sub-scale scores for hazardous alcohol use, dependence symptoms and harmful alcohol use are 2.73 ( $n=245$ ,  $SD=2.20$ ) 2.41 ( $n=578$ ,  $SD=2.03$ ), and 1.37 ( $n=243$ ,  $SD=1.56$ ); and 1.15 ( $n=573$ ,  $SD=1.65$ ), 3.71 ( $n=245$ ,  $SD=3.21$ ), and 2.70 ( $n=576$ ,  $SD=2.87$ ), for hospitality majors and other majors, respectively. The mean differences ( $p=.05$ ) were significant for the total AUDIT score and for all sub-scale excepting the measure for alcohol dependence. See Table 1.

Table 1: Analysis of Variance of AUDIT Scores by Major

Source		Sum of Squares	df	Mean Square	F	p	$\eta$
AUDIT Total	Between Groups	427.453	1	427.453	14.017	.000	.130
	Within Groups	24732.505	811	30.496			
	Total	25159.958	812				
Hazardous Alcohol Use	Between Groups	17.875	1	17.875	4.111	.043	.071
	Within Groups	3569.861	821	4.348			
	Total	3587.735	822				
Dependence Symptoms	Between Groups	8.364	1	8.364	3.180	.075	.062
	Within Groups	2141.381	814	2.631			
	Total	2149.745	815				
Harmful Alcohol Use	Between Groups	177.561	1	177.561	20.071	.000	.155
	Within Groups	7245.438	819	8.847			
	Total	7422.999	820				

Confidence intervals (95%) were also established and overlapped for hazardous alcohol use and dependence symptoms. That is, the mean differences between hospitality majors and other majors must be rejected for these two sub-scales. About 53 percent (52.7%) of the hospitality students have an AUDIT score in the 0-7 range and are classified as low-risk drinkers or non-drinkers, while 36.5 percent score in the 8-15 range indicating a medium level of alcohol risk, and 6.5 percent score in the 16-19 range and are at high risk. Four percent (4.0%) score between 20 and 30 on AUDIT, placing them in the 20-40 range identified as very high risk of hazardous and harmful alcohol consumption. Considering other majors, 66.6 percent of the sample is classified as low risk drinkers or non-drinkers, 26.2 percent at a medium level of risk, 4.1 percent at high risk, and 3.1 percent at very high risk of hazardous and harmful alcohol consumption.

Twenty-five percent (25.0%) of the total sample report having six or more drinks in a row, 5.6 percent report black-outs, 5.0 percent were not able to stop drinking once started, 3.8 percent felt remorse after drinking, 2.3 percent failed to do what was expected of them as a result of drinking, and 0.9 percent needed an eye-opener when they woke. At some point in time 31 percent were injured due to drinking and 11.8 percent received advice to reduce or discontinue their drinking. The same data when broken down by hospitality major and other major, respectively, are as follows: 28.2 and 24.6 percent, 8.5 and 4.4 percent, 5.3 and 4.9 percent, 4.9 and 3.5 percent, 1.6 and 2.6 percent, 0.8 and 1.0 percent, 37.4 and 28.2 percent, and 16.7 and 11.9 percent.

Employed students (n=547) have a total AUDIT score of 6.75 while the non-employed (n=266), have a total AUDIT score of 6.59. The scores for the sub-scales are 2.47 and 2.58 on hazardous alcohol use, 1.27 and 1.09 on dependence symptoms, and 3.04 and 2.91 on harmful alcohol use, for employed students and non-employed students, respectively. These mean differences are not significantly different ( $p>.05$ ). See Table 2.

Table 2:  
Analysis of Variance of AUDIT Scores by Employed not Employed

Source		Sum of Squares	df	Mean Square	F	p	$\eta$
AUDIT Total	Between Groups	4.439	1	4.439	.143	.705	.013
	Within Groups	25155.519	811	31.018			
	Total	25159.958	812				
Hazardous Alcohol Use	Between Groups	2.519	1	2.519	.577	.448	.026
	Within Groups	3585.216	821	4.367			
	Total	3587.735	822				
Dependence Symptoms	Between Groups	5.800	1	5.800	2.202	.138	.052
	Within Groups	2143.945	814	2.634			
	Total	2149.745	815				
Harmful Alcohol Use	Between Groups	3.020	1	3.020	.333	.564	.020
	Within Groups	7419.979	819	9.060			
	Total	7422.999	820				

Comparing those employed in hospitality businesses (n=164) with those that are employed elsewhere (n=382), Levene's test did not find support for equal variances ( $W=4.185$ ,  $df_1=1$ ,  $df_2=544$ ,  $p<.05$ ) and an independent sample T-test is used. Students that are employed in hospitality businesses have a total AUDIT score of 8.07 compared to a total AUDIT of 6.17 for those employed elsewhere. The sub-scale scores for hazardous alcohol use, dependence symptoms and harmful alcohol use are 2.84 and 2.29, 1.50 and 1.17, and 3.72 and 2.75 for employees of hospitality businesses and those employed elsewhere, respectively. The independent samples t-tests found all of these differences to be significantly different ( $p<.05$ ). Two of the sub-scales did show equality of variance ( $p>.05$ ). Please see Table 3.

Table 3:  
Independent Samples T-test for Equality of Mean  
AUDIT Scores by Hospitality Business Employee and Employed Elsewhere

Source		Levene's Test		t	df	p
		F	p			
AUDIT Total	Equal Variances Assumed	4.185	.041	3.619	544	.000
	Equal Variances Not Assumed			3.424	273.741	.001
Hazardous Alcohol Use	Equal Variances Assumed	1.816	.178	2.887	551	.004
	Equal Variances Not Assumed			2.746	282.649	.006
Dependence Symptoms	Equal Variances Assumed	1.447	.229	2.091	546	.037
	Equal Variances Not Assumed			2.054	301.387	.041
Harmful Alcohol Use	Equal Variances Assumed	9.640	.002	3.386	551	.001
	Equal Variances Not Assumed			3.161	271.863	.002

About 52 percent (51.8%) of those employed by hospitality businesses are low-risk drinkers or non-drinkers, while 34.0 percent are at moderate risk, 7.2 percent are at high risk and 6.6 percent are at very high risk of hazardous and harmful alcohol consumption. For those employed elsewhere, 66.0 percent are low-risk drinkers or non drinkers, while 27.5 percent are at moderate risk, 4.1 percent at high risk, and 2.4 percent at very high risk of hazardous and harmful alcohol consumption.

A total of 156 students employed by hospitality businesses reported the type of hospitality business in which they work. They were classified as a) food and beverage operations serving alcohol ( $n=56$ ), b) food service operations not serving alcohol ( $n=41$ ), c) lodging operations ( $n=36$ ), d) event/conference/meeting planner ( $n=9$ ), and e) other ( $n=15$ ). The mean AUDIT differences were not significantly different ( $p>.05$ ) and all 95% mean confidence intervals overlapped.

Approximately 90% of the employed reported their position. The hospitality business employees were classified as working as cook, server, desk clerk, supervisor/manager/chef and other. Variance was not homogenous ( $W=2.774$ ,  $df_1=4$ ,  $df_2=200$ ,  $p<.05$ ), and the Welch and Brown-Forsythe tests of equality of means was applied, finding no statistical differences ( $p>.05$ ). The 95% confidence intervals overlap for the AUDIT total mean score and for each AUDIT sub-scales. Turning to non-hospitality occupations, the assumption of variance homogeneity is rejected ( $W=2.055$ ,  $df_1=8$ ,  $df_2=325$ ,  $p<.05$ ), but both the Welch test and the Brown-Forsythe tests of equality of means suggest ( $p<.05$ ) suggest that receptionists and call center employees consume less than other non-hospitality occupations.

Finally, AUDIT scores were considered from the perspective of gender, age and hours worked per week. The variance in AUDIT scores is not homogenous across gender ( $W=8.383$ ,  $df_1=1$ ,  $df_2=795$ ,  $p<.05$ ). An independent sample t-test established a significant ( $p<.05$ ) difference with an AUDIT total score of 8.15 for men and 5.86 for women. The sub-scale scores for hazardous alcohol use, dependence symptoms and harmful alcohol use are 3.47 and 1.94, 1.39 and 1.11, and 3.34 and 2.81 for men and women, respectively. Considering gender differences by sub-populations, male hospitality students have a total AUDIT score of 9.77 while the total AUDIT score for female hospitality students is 7.21; the total AUDIT score for male and female students in other majors are 7.73 and 5.13, respectively. Both sub-sample differences are significant ( $p=.05$ ). The total AUDIT scores for employees of hospitality businesses are 9.48 for men and 7.43 for women, while the total AUDIT scores for employees elsewhere are 7.95 for men and 5.25 for women. Only the latter mean difference is statistically significant ( $p=.05$ ).

Age was correlated with AUDIT and a significant ( $p<.01$ ) negative correlation was found between age and each of the AUDIT measures. The Pearson correlation coefficient is  $r=-.17$  for age and AUDIT total, while the coefficients between age and the sub-scales for hazardous alcohol use, dependence symptoms and harmful alcohol use are,  $r=-.10$ ,  $r=-.14$ , and  $r=-.17$ , respectively. Considering hours worked, significant mean differences are found ( $F(4,539)=2.535$ ,  $p<.05$ ) with 40 hours or more at 4.73, 30-39 hours at 5.07, 20-29 hours at 6.83, 10-19 hours at 7.15, and less than 10 at 6.90, however, a consideration of the 95% confidence interval shows that the significant difference exist only between those working 40 hours of more and those working 10-19 hours.

## DISCUSSION

Alcohol consumption among the sample of hospitality students is consistent with the Scandinavian studies (Larsen, 1994; Larsen & Jørgensen, 2003). While the various Scandinavian AUDIT scores are above and below the

total AUDIT score of 7.81, a 95 percent confidence interval around the AUDIT total score establishes that they are not significantly different. Larsen and Jørgensen (2003) reported that 35.5 percent of their student sample as a whole scored 8 or higher on AUDIT, while 37.5 percent of our total student sample scored 8 or higher. These findings are practically the same. Thus, RQ1 has been answered affirmatively. Hospitality students consume alcohol at levels comparable to that of their Scandinavian counterparts.

The Scandinavian studies and this study found some evidence of hospitality students consuming alcohol at levels higher than other majors but neither set of results were conclusive. The total AUDIT scores for hospitality majors (7.81) is significantly different from that of other majors (6.23), but at the subscale level, significant differences are only noted for harmful alcohol use. Hospitality majors are at moderately higher risk than other majors. It is particularly important to note the risk categories of high and very high for both groups of students. While the risk percentages combined are 10.8 percent and 7.2 percent, respectively, they represent a large number of students which may need counsel. The sample total at high or very high risk is 9.2 percent.

This study suggests less alcohol consumption, fewer black-outs and less drinking remorse within our sample and sub-samples when compared to the students in Fleming, Barry and MacDonald's (1991) study. This sample, however, has a much higher rate of injuries due to drinking and reports moderately higher incident rates for consuming 6 or more drinks on a single occasion, for receiving advice to reduce or discontinue alcohol consumption and for not being able to stop drinking once started. Considering the two sub-samples of hospitality and other majors, hospitality majors report higher incident rates than other majors on all AUDIT measurement items except failing to do what was expected and needing an eye-opener, at the weekly or higher rate of occurrence.

Knight et al (2002) reported 62.2 percent as neither alcohol dependent nor alcohol abusers. In this study a comparable 62.5 percent scored below the recommended cut-off of 8 on AUDIT. At the sub-sample level 52.7 percent hospitality majors and 66.6 percent of other majors score below the cut-off indicating potential for hazardous and harmful alcohol use. The proportion of students in this study that are likely to be heavy and frequent drinkers are slightly below Presley and Pimental's (2006) levels. The evidence for RQ2 is mixed. Comparing sub-samples, hospitality majors appear to consume more alcohol than other majors, but the relationship is not consistent across all indicators. Furthermore, when comparing this study's consumption data with that of earlier studies of US college students, the findings are roughly consistent.

Those working in hospitality consumed alcohol at higher rates and were at higher risk of hazardous and harmful alcohol consumption than those who worked elsewhere. This is consistent with Kouvonen and Lintonen's (2002) findings and with Corsun and Young's (1998) albeit non-significant findings. The rate for hospitality employees was, furthermore, comparable to that of Larsen's (1994) restaurant employees, while the remainder of Larsen's (1994) AUDIT scores are below the scores for both employee sub-samples. Kjærheim et al. (1995) did not use the AUDIT measure, but comparing their heavy drinker category with the AUDIT high risk category, relative parity is established with the high risk rate. When the high risk category is considered from the perspective of gender, the male hospitality business employee rate (10.0%) is higher than Kjærheim et al.'s (1995) rate for heavy drinkers, while the rate for women in both studies is comparable. In sum, support for RQ3 is found in that the levels of alcohol consumption are consistent with those of the Scandinavian studies. Support for RQ4 is also found in that hospitality business employees consume alcohol at higher rates than those employed elsewhere.

No difference in alcohol consumption is found across hospitality businesses and hospitality occupations in this sample. Thus RQ5 is not supported. Considering non-hospitality occupations, it appears that employees that

work as receptionists or call center employees consume alcohol at markedly lower levels than other non-hospitality business categories. RQ6 is supported.

Women in this study drank considerably less than men. The AUDIT score for men place them at a medium alcohol risk, while the women fall into the low-risk drinking or abstinence category. The AUDIT sub-scales also reveal a gender difference with male students scoring significantly higher ( $p=.05$ ) than female students. The gender difference can also be found in the major and employment sub-samples.

The slight negative correlation between AUDIT scores and age suggests that as student's age, they consume less alcohol and decrease their participation in risky and harmful alcohol consumption. This is consistent with Fennell, Rodin and Kantor (1981), Fillmore, et al. (1993) and Hingson, Mangione and Barrett (1981), but contrary to Corsun and Young's (1998) findings. Finally, a negative association between hours worked per week and AUDIT scores, suggests that the more students work, the less likely they are to engage in hazardous and harmful alcohol consumption. This is at odds with the findings of Kouvonen and Lintonen (2002).

### **CONCLUSION AND IMPLICATIONS**

The alcohol consumption levels among hospitality students in this study were comparable to that of the Scandinavian hospitality students, adding external validity to both studies and the expectation that the findings can be replicated and extended further. This raises the questions whether there are interpersonal similarities among students and practitioners of hospitality business or structural elements across hospitality organizations and cultures that can help explain these findings. For example, can students' choice of hospitality as major or employees' choice to work in a hospitality business be explained by a predisposition or personality trait that also explains alcohol consumption? Do hospitality businesses have some common characteristic that is associated with an increased predilection for alcohol consumption? Kjærheim and colleagues (Kjærheim, et al. 1995; Kjærheim, Mykletun & Haldorsen, 1996) have started to investigate these questions.

While the mean total AUDIT scores were below the recommended cut-off, more than a third of the hospitality majors scored above the cut-off and nearly 11 percent were in the high or very high alcohol risk categories. Seven percent of other majors were also in these risk categories. The hospitality sub-sample scored higher than other majors on all AUDIT items except failing to perform due to alcohol consumption and needing a drink to recover the following day. This difference may suggest hospitality students have more experience in managing their alcohol consumption than other majors. Do hospitality students and hospitality employees have an increased dispositional and functional alcohol tolerance (Vogel-Sprout, 1992) in comparison to other referent populations?

Many aspects of the findings are similar to studies of other college populations. The differences, however, are also important, and the much higher rate of injuries due to alcohol consumption and the somewhat higher rate of not being able to stop drinking once started are troubling and warrant further exploration in future research. Perhaps the latter is indicative of an increased tendency to binge drink among hospitality populations, which leads to increased intoxication and more alcohol related injuries.

While all employees in this study were college students and not reflective of employees at large, this study provides additional evidence that employees of hospitality businesses consume more alcohol than employees elsewhere. The reported levels are consistent with earlier hospitality business samples, suggesting these findings are

not artifacts of the study. This claim is bolstered by finding no differences in consumption across hospitality businesses or hospitality occupations. Can this finding be attributed to characteristics of hospitality employees or hospitality businesses? Additional research is needed.

Gender differences persist across most alcohol studies, including this one with the exception of a non-significant gender effect within the hospitality employees group. Men consistently drink more than women. Given this difference, the degree and focus of alcohol education and interventions should discriminate between male and female target audiences. It would also be useful to learn why the gender difference exists and persists. A negative correlation between age and alcohol consumption has been found in most studies, as in this one. The negative association found between hours worked and alcohol consumption needs further investigation. Perhaps students that need to work to attend college are less inclined to waste time and money on excessive alcohol consumption.

In sum, the frequent claim that hospitality students and hospitality employees consume alcohol at higher rates than students and employees with different affiliations is confirmed. Some explanations for the disparate alcohol consumption have been proposed. Theoretical explanations for the observed patterns are needed.

### **LIMITATIONS**

This is a pilot study and as such has a rather small sample size drawn from within a rather limited sampling frame, furthermore we discuss sub-samples within, which by nature are even smaller. Care should be taken in generalizing from this study. It should also be noted that our sampling may have included students from other countries currently studying in the United States and their cultural orientations may have influenced their attitudes and perceptions of alcohol consumption differently than seen among American students. Furthermore, we drew the major and employee sub-samples from the same sample frame, thus the same students may show up in both sub-samples.

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