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Addictive Behaviors



Short Communication

Heavier drinking American college students may self-select into study abroad programs: An examination of sex and ethnic differences within a high-risk group

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ABSTRACT

As with other heavier drinking groups, heavier drinking American college students may self-select into study abroad programs with specific intentions to use alcohol in the foreign environment. This cross-sectional study used a sample of 2144 students (mean age = 20.00, $SD = 1.47$) to explore differences in alcohol use and related negative consequences among (1) students intending to study abroad while in college, (2) students not intending to study abroad, and (3) students reporting prior study abroad participation. Results revealed that participants with no intention to study abroad drank less and experienced fewer alcohol-related consequences than participants intending to study abroad. In addition, students reporting prior completion of study abroad programs drank more and reported more hazardous alcohol use than those not intending to study abroad. Ethnic and sex differences existed; with White students, males, and females intending to study abroad and non-White students who previously completed study abroad programs demonstrating the most risk. These findings provide empirical support that study abroad students may be a heavier drinking subgroup necessitating intervention prior to beginning programs abroad.

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1. Introduction

Students studying abroad represent a large and diverse subgroup of the U.S. college population. Approximately 1/4 million students completed study abroad (SA) programs during the 2006–2007 academic year – and the number of students studying abroad has been steadily increasing over the past 20 years (Institute of International Education, 2009). While SA experiences promote enhanced global perspectives, cross-cultural competencies, and increased self-confidence (Carlson & Widaman, 1988; Kitsantas, 2004; McCabe, 1994), SA students may be at risk for increased and problematic drinking. Students may drink heavily while abroad due to lower drinking age limits, increased freedom and independence, difficulties adapting to a new environment, actual and perceived pressures within a new social environment, and pre-departure intentions to consume alcohol while abroad (Borsari & Carey, 2001; Church, 1982; Pedersen, LaBrie, & Hummer, 2009; Pedersen, Larimer, & Lee, in press).

Research suggests heavier drinking college students may self-select into heavier drinking groups (e.g., Greek organizations) and environments (Bullers, Cooper, & Russell, 2001; Park, Sher, & Krull,

2008; Sher & Rutledge, 2007). Similarly, SA students may be a self-selecting, heavier drinking group who may choose to SA specifically for alcohol use and other social expectancies. An examination of SA students as a self-selecting heavy drinking group would provide empirical support for the development of targeted interventions to reduce already established drinking patterns and prevent increased and problematic drinking while abroad.

The present study compared the drinking behavior of students intending to SA, those without intention to SA, and those reporting prior SA participation. We hypothesized that students with no intention to SA would drink less and experience fewer negative consequences than those intending to go abroad and those returning from overseas trips. Further, while increasing numbers of ethnic minorities are studying abroad each year, the majority of SA students are White (about 82%) and about 65% are female (Institute of International Education, 2009). White college students are more likely to engage in heavy drinking and experience consequences from use than students of other ethnicities (Office of Applied Studies, 2008; Pascal, Bersamin, & Flewelling, 2005) and male students are traditionally heavier drinkers than female students on U.S. campuses (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Thus, ethnicity (specifically, White versus non-White) and sex were examined as factors associated with self-selection to determine if observed effects were simply a function of heavier drinking White and male students being more likely to SA in college. We hypothesized that those with no intention to SA would drink less and experience fewer consequences regardless of ethnicity or sex.

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2. Materials and method

2.1. Participants

A random sample of 6495 students at a large West-Coast university was emailed an invitation to complete a confidential screening survey for inclusion in a broader study. A total of 3164 (49% response rate) completed the survey, which included a question about SA status. The present analyses included only students who intended to SA (N=927), those who did not intend to SA during college (N=932), and those who had already studied abroad (N=285). Not included were students undecided about studying abroad (N=1009) or who indicated no response (N=11). Thus, the sample consisted of 2144 students (57% female) with a mean age of 20.00 (SD=1.47) years. Five percent identified as Hispanic/Latino(a) race. Ethnicity of the sample was 47% Caucasian/White, 37% Asian, 1% Black/African-American, 10% multiple ethnicities, and 5% "other;" similar in make-up to the broader campus.

2.2. Procedures and measures

During autumn of 2008, participants completed an online confidential screening survey of demographics and alcohol use. After answering questions regarding age, sex, race, ethnicity, and SA status, participants indicated their typical weekly drinking behavior over the past month using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Standard drinks were defined (National Institutes of Health (NIH) (2005)). Participants also completed the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), designed to assess for early signs of alcohol dependence resulting from harmful and hazardous patterns of use ($\alpha=0.81$). A modified Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) asked participants whether they experienced each of 23 alcohol-related problems in the past month (yes/no response). Two additional items assessed for driving after drinking more than two drinks and more than four drinks (25 items; $\alpha=0.92$).

3. Results

Data analyses consisted of comparing means of alcohol use and consequences among three groups. A multivariate analysis of variance (MANOVA) with follow-up tests was performed (see Table 1 for a correlation matrix of variables). Fixed factors included SA group (those reporting intention to SA, those reporting no intention to SA, and those reporting prior SA participation), ethnicity (White and non-White), and sex (male and female). Multivariate normality was assumed and variations in *dfs* reflect missing data, which were randomly spread across SA groups.

Table 1
Correlation matrix between dependent and independent variables.

	1	2	3	4	5	Mean (SD) or percentage
1. Ethnicity ^a	–					47% White
2. Sex ^b	–0.03	–				57% female
3. Drinks per week	0.20*	–0.24*	–			6.28 (8.39)
4. AUDIT score	0.21*	–0.17*	0.75*	–		3.15 (3.59)
5. RAPI score	0.08	–0.09	0.53*	0.69*	–	6.36 (5.15)

Note: RAPI = Rutgers Alcohol Problem Index and AUDIT = Alcohol Use Disorder Identification Test.

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*Correlation significant at $p<0.05$.

^a Ethnicity coded 0 = non-White, 1 = White.

^b Sex coded 0 = male, 1 = female.

The MANOVA revealed an overall main effect for SA group, Wilk's $\Lambda=0.97$, $F(6, 4058)=11.08$, $p<0.001$; ethnicity, Wilk's $\Lambda=0.96$, $F(3, 2029)=25.32$, $p<0.001$; and sex, Wilk's $\Lambda=0.95$, $F(3, 2029)=37.50$, $p<0.001$. Two-way interaction effects were found for SA group \times ethnicity, Wilk's $\Lambda=0.99$, $F(6, 4058)=2.59$, $p<0.001$, and SA group \times sex, Wilk's $\Lambda=0.99$, $F(6, 4058)=3.13$, $p<0.001$. Ethnicity \times sex and the three-way interaction were non-significant.

Between subjects tests revealed a significant difference among the three groups for drinks per week, $F(2, 2031)=29.43$, $p<0.001$; AUDIT, $F(2, 2031)=22.36$, $p<0.001$; and RAPI, $F(2, 2031)=5.44$, $p<0.01$. Between subjects effects were also observed for ethnicity for drinks per week, $F(1, 2031)=39.42$, and AUDIT, $F(1, 2031)=47.11$; as well as for sex and all three dependent variables; drinks per week, $F(1, 2031)=109.50$, AUDIT, $F(1, 2031)=49.69$, and RAPI, $F(1, 2031)=12.72$ (all $p<0.001$). The two-way interaction between SA group and ethnicity was significant for drinks per week, $F(2, 2031)=6.80$, $p<0.01$, AUDIT, $F(2, 2031)=4.89$, $p<0.01$, and RAPI, $F(2, 2031)=3.97$, $p<0.05$. The SA group \times sex interaction was significant for drinks per week, $F(2, 2031)=8.48$, $p<0.001$, and marginally significant for AUDIT, $F(2, 2031)=2.92$, $p=0.05$.

Means and standard errors of drinking and consequences by SA group for all participants and within ethnicity and sex are presented in Table 2. Post-hoc analyses using a Bonferroni correction revealed that among all participants, those with no intention to SA drank fewer drinks per week than those intending to SA and those reporting prior SA participation. Participants with no intention to SA had lower composite AUDIT scores than those intending to SA and those reporting prior SA

Table 2
Means and standard errors of drinking and alcohol-related consequences by study abroad group and ethnicity or sex.

	Drinks per week		AUDIT		RAPI	
	M	(SE)	M	(SE)	M	(SE)
<i>All participants</i>						
Intend to study abroad	7.29	(0.31) ^a	7.23	(0.19) ^a	3.39	(0.14) ^a
No intention to study abroad	5.10	(0.24) ^b	5.93	(0.18) ^b	2.74	(0.15) ^b
Previously studied abroad	6.78	(0.47) ^a	7.16	(0.30) ^a	3.08	(0.23) ^{a,b}
<i>White</i>						
Intend to study abroad (N=463)	9.69	(0.49) ^a	8.39	(0.25) ^a	2.78	(0.16) ^a
No intention to study abroad (N=402)	6.41	(0.41) ^b	6.58	(0.25) ^b	2.00	(0.17) ^b
Previously studied abroad (N=149)	7.38	(0.63) ^b	7.49	(0.33) ^{a,b}	1.89	(0.18) ^b
<i>Non-White</i>						
Intend to study abroad (N=464)	5.09	(0.34) ^{a,b}	5.42	(0.24) ^{a,b}	2.01	(0.17) ^a
No intention to study abroad (N=529)	4.23	(0.28) ^a	4.97	(0.20) ^b	1.87	(0.17) ^a
Previously studied abroad (N=134)	6.17	(0.71) ^b	6.33	(0.43) ^b	2.30	(0.35) ^a
<i>Males</i>						
Intend to study abroad (N=327)	10.88	(0.67) ^a	8.48	(0.34) ^a	2.93	(0.22) ^a
No intention to study abroad (N=504)	6.19	(0.38) ^b	6.19	(0.25) ^b	2.17	(0.19) ^b
Previously studied abroad (N=93)	10.55	(1.08) ^a	8.38	(0.53) ^a	2.67	(0.38) ^{a,b}
<i>Females</i>						
Intend to study abroad (N=600)	5.34	(0.27) ^a	6.05	(0.21) ^a	2.13	(0.14) ^a
No intention to study abroad (N=428)	3.85	(0.26) ^b	5.03	(0.21) ^b	1.65	(0.16) ^a
Previously studied abroad (N=192)	4.99	(0.41) ^{a,b}	6.24	(0.30) ^a	1.79	(0.22) ^a

Note: Items with different subscripts within all participants, ethnicity, and sex and dependent variable represent significant differences at $p<0.05$.

participation. Further, those intending to SA experienced more RAPI consequences in the past month than those not intending to SA.

Males and females exhibited patterns similar to the overall sample results. Both males and females with intentions to SA drank more and displayed higher AUDIT scores than those not intending to SA. Males with prior SA experience drank more than males not intending to SA. Both males and females with prior SA participation had higher AUDIT scores, while only males with intentions to SA experienced higher RAPI scores than males not intending to SA.

White participants intending to SA drank more than White participants not intending to SA and those who reported prior SA participation, while non-White participants who previously studied abroad drank more than those with no intention to SA. Whites who intended to SA and non-Whites with prior SA experience reported higher AUDIT scores than those within ethnicity with no intention to SA. Whites intending to SA reported more RAPI consequences than those not intending to SA and those with prior SA experience.

4. Discussion

Students intending to SA during college may represent a self-selecting group of heavier drinkers who also experience consequences to a greater extent than students not intending to SA. Not only was risk higher among those intending to SA, but students back on campus with SA experience also reported more drinking and more hazardous/harmful drinking than those not intending to SA. Despite Whites being more likely to SA and report heavier drinking in the general population (Institute of International Education, 2009; Office of Applied Studies, 2008), these self-selection effects were not solely explained by ethnic differences among the three SA groups. That is, differences existed among the groups within ethnic categories, such that White students who intended to SA and non-White students who returned from SA trips were the heaviest drinkers experiencing the most risk. For Whites, drinking heavily prior to trips abroad may lead to further heavy drinking and consequences within a new environment. As the majority of SA students are White, perhaps minority students spend time with the heavier drinking White students while abroad and continue these heavier patterns upon return home. Examining drinking among ethnicities during the SA trip is a logical next step to this research.

Differences between groups within sex also existed. Both males and females intending to SA drank at the highest levels. Male students intending to SA and those with previous SA experience reported mean AUDIT scores cresting the level considered an indicator of hazardous/harmful drinking (Saunders et al., 1993). Given existing thought and available empirical evidence about this subgroup (Epstein, 2005; Pedersen et al., in press), this research begins to identify students who are likely to participate in SA programs as potentially high-risk.

These findings hold important implications for future research and potential preventive program development, particularly in light of personality research demonstrating that individuals actively opt for environments compatible with their own dispositions; especially during transitional experiences (Buss, 1987; Caspi & Bem, 1990). Classic research indicates that past behavior is among the best predictors of future behavior and recent research indicates strong associations between pre-abroad intentions to drink and subsequent drinking behavior while abroad (Pedersen et al., 2009). Thus, targeting students' established drinking behavior and intentions to drink prior to departure using empirically validated approaches (e.g., Dimeff, Baer, Kivlahan, & Marlatt, 1999) may help prevent continued heavy drinking within the foreign environment. Drinking in new contexts exposes students to numerous risks unique to the SA environment (e.g., trouble with foreign authorities, disrupted travel plans, offending host families or local people) and problems may be exacerbated by limited access to resources and familiar coping strategies (e.g., being far from friends/family). Furthermore, results also illustrate that students (particularly non-Whites and males) who have completed

SA programs generally report elevated drinking levels and consequences relative to those not intending to SA. Perhaps intervening with students post-return to the U.S. after trips can help reduce newly established heavier drinking patterns as student reorient back into the American culture.

This study is limited by the cross-sectional design at one site reliant on self-report data; which hinders generalizability to other populations. As students were not tracked over time, it is unknown whether those intending to SA actually completed SA trips during college. Future research is certainly needed to disentangle the current findings by conducting a within-subjects longitudinal examination of drinking and consequences from pre-departure, through the abroad experience, and then upon reentry to the U.S. Although not assessed, an alternative explanation of findings might include socio-economic status (SES). It may be that only those with higher SES intend to SA and that higher SES students drink more heavily.

5. Conclusion

Despite these limitations, our findings indicate that those students intending to SA and those returning from SA trips exhibited elevated levels of alcohol use and related harm. The findings also inform important avenues for future research. Intervention strategies targeting high-risk groups (Larimer et al., 2001) and high-risk events (e.g. Neighbors, Lee, Lewis, Fossos, & Walter, 2009) have been shown to be efficacious within college student populations and have potential applicability in this context for these self-selecting students. While focus is generally placed on intervention with student members of high-risk groups, perhaps preventative programs prior to initiation into heavy drinking groups (e.g., Greek organizations and athletic teams) may also be important to consider. Additional research is needed to delineate between the likely interplay of self-selection and pro-alcohol environmental influences during SA experiences among more specific ethnic subsamples to determine who is at risk and how such risk can be attenuated when in a foreign environment.

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Contributors

Eric Pedersen designed the study, wrote the research protocol, analyzed data, and prepared the first draft of this manuscript. Joseph LaBrie and Justin Hummer assisted with analyses and conceptualization of the manuscript, and prepared edited versions of the manuscript. Mary Larimer and Christine Lee assisted in study design and preparation of edited versions of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of Interest

All authors declare that they have no conflicts of interest.

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References

- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391–424.
- Bullers, S., Cooper, M. L., & Russell, M. (2001). Social networks drinking and adult alcohol involvement: A longitudinal exploration of the direction of influence. *Addictive Behaviors*, 26, 181–199.
- Buss, D. M. (1987). Selection, evocation, and manipulation. *Journal of Personality and Social Psychology*, 53, 1214–1221.
- Caspi, A., & Bem, D. J. (1990). Personality continuity and change across the life course. In L. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 549–575). New York: Guilford Press.
- Carlson, J. S., & Widaman, K. F. (1988). The effects of study abroad during college on attitudes toward other cultures. *International Journal of Intercultural Relation*, 12, 1–18.
- Church, A. (1982). Sojourner adjustment. *Psychological Bulletin*, 91, 540–572.

- Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*, 53, 189–200.
- Dimeff, L. A., Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1999). *Brief Alcohol Screening and Intervention for College Students (BASICS): A harm reduction approach*. New York, NY: The Guilford Press.
- Epstein, J. (2005). Last call for U.S. students studying abroad? *Continuing concerns about alcohol use and abuse during study abroad SAFETI On-Line Newsletter*, vol. 3, Available at http://gloaled.us/safeti/v3n1_epstein.html.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2009). Monitoring the future national survey results on drug use, 1975–2008. *Volume II: College students and adults ages 19–50*. Bethesda, MD: National Institute on Drug Abuse NIH Publication No. 09-7403. 306 pp.
- Kitsantas, A. (2004). Studying abroad: The role of college students' goals on the development of cross-cultural skills and global understanding. *College Student Journal*, 38, 441–453.
- Institute of International Education. (2009). Open Doors Report 2009: Americans Studying Abroad Retrieved from the web 18 December 2009 at <http://opendoors.iienetwork.org>.
- Larimer, M. E., Turner, A. P., Anderson, B. K., Fader, J. S., Kilmer, J. R., Palmer, R. S., & Cronce, J. M. (2001). Evaluating a brief alcohol intervention with fraternities. *Journal of Studies on Alcohol*, 62, 370–380.
- McCabe, L. T. (1994). The development of a global perspective during participation in semester at sea: A comparative global education program. *Educational Review*, 46, 275–286.
- National Institutes of Health (NIH). (2005). Helping patients who drink too much: A clinician's guide NIH Publication No. 07-3769.
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Walter, T. (2009). Internet-based personalized feedback to reduce 21st birthday drinking: A randomized controlled trial of an Event Specific Prevention Intervention. *Journal of Consulting and Clinical Psychology*, 77, 51–63.
- Office of Applied Studies. (2008). *Results from the 2007 National Survey on Drug Use and Health: National Findings*. Rockville, MD: Substance Abuse and Mental Health Services Administration DHHS Publication No. SMA 08-4343, NSDUH Series H-34.
- Park, A., Sher, K. J., & Krull, J. L. (2008). Risky drinking in college changes as fraternity/sorority affiliation changes: A person–environment perspective. *Psychology of Addictive Behaviors*, 22, 219–229.
- Pascal, M. J., Bersamin, M., & Flewelling, R. L. (2005). Racial/ethnic differences in the association between college attendance and heavy alcohol use: A national study. *Journal of Studies on Alcohol*, 66, 266–274.
- Pedersen, E. R., LaBrie, J. W., & Hummer, J. F. (2009). Perceived behavioral alcohol norms predict drinking for college students while studying abroad. *Journal of Studies on Alcohol and Drugs*, 70.
- Pedersen, E. R., Larimer, M. E., and Lee, C. M. (in press). When in Rome: Factors associated with changes in drinking behavior among American college students studying abroad. *Psychology of Addictive Behaviors*.
- Saunders, J. B., Aasland, O. G., Babor, T. F., De La Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption II. *Addiction*, 88, 791–804.
- Sher, K. J., & Rutledge, P. C. (2007). Heavy drinking across the transition to college: Predicting first-semester heavy drinking from precollege variables. *Addictive Behaviors*, 32, 819–835.
- White, H. R., & Labouvie, E. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50, 30–37.