

Perceived Importance of Marijuana to the College Experience Scale (PIMCES): Initial Development and Validation

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ABSTRACT. Objective: Internalization of college substance use culture refers to the degree to which an individual perceives the use of that substance to be an integral part of the college experience. Although there is a growing literature characterizing this construct for alcohol, the present study describes the development and validation of a new measure to assess the internalization of the college marijuana use culture, the Perceived Importance of Marijuana to the College Experience Scale (PIMCES). **Method:** We recruited a large, diverse sample ($N = 8,141$) of college students from 11 participating universities. We examined the psychometric properties of the PIMCES and evaluated its

concurrent validity by examining its associations with marijuana-related outcomes. **Results:** A single-factor, eight-item PIMCES demonstrated good model fit and high internal consistency (Cronbach's $\alpha = .89$) and was correlated with marijuana user status, frequency of marijuana use, marijuana consequences, and injunctive norms. **Conclusions:** Overall, the PIMCES exhibits sound psychometric properties. The PIMCES can serve as a possible mediator of the effects of personality and other factors on marijuana-related outcomes and may be a promising target for marijuana interventions. (*J. Stud. Alcohol Drugs*, 78, 319–324, 2017)

DECADES OF RESEARCH have demonstrated the importance of perceived norms in predicting substance use behaviors (for alcohol, see Borsari & Carey, 2003; for drug use and other risky behaviors, see Martens et al., 2006). As such, the most common approach used for brief interventions targeting college student substance use is personalized normative feedback (Neal & Carey, 2004; Lewis & Neighbors, 2006; Young et al., 2016), which is designed to correct normative misperceptions (i.e., overestimates of the prevalence or amount of use in the population) and in turn influence substance use outcomes via social influence processes.

Typically, perceived norms are parsed into descriptive and injunctive norms. Whereas descriptive norms reflect beliefs about the behavior of others, injunctive norms reflect beliefs about the degree to which others approve/disapprove of a particular behavior (Baer et al., 1991; Cialdini et al., 1991; Larimer et al., 2004). Research shows that both descriptive and injunctive norms independently predict alcohol out-

comes (Borsari & Carey, 2003; Neighbors et al., 2007) and other substance use (e.g., stimulants; Silvestri & Correia, 2016), including marijuana use (Connor & McMillan, 2010; Napper et al., 2016; Neighbors et al., 2008).

More recently, Osberg and colleagues (2010) introduced the concept of the internalization of college drinking culture, which reflects beliefs about the degree to which alcohol use is considered an integral part of the college experience. It is proposed that these beliefs come from societal norms that alcohol use is a natural part of being a college student or a rite of passage during this developmental stage. Operationalized using the College Life Alcohol Salience Scale (CLASS; Osberg et al., 2010), these norms can then be internalized by individuals and influence their drinking. Importantly, several studies have demonstrated that the CLASS predicts alcohol outcomes above and beyond the effects of descriptive/injunctive norms (Hustad et al., 2014; Osberg et al., 2011; Pearson & Hustad, 2014). Given the relevance of this internalization of the college drinking culture in predicting alcohol use/

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problems, we reasoned that it is warranted to examine this construct for other substances.

The purpose of the present study was to develop and assess a measure of the perceived importance of marijuana to the college experience adapted from the CLASS (Osberg et al., 2010). We conceptualized this construct as representative of the extent to which a person believes that marijuana use plays a central role in the college experience or the internalization of college marijuana use culture. Based on past research on the CLASS (Hustad et al., 2014; Osberg et al., 2010, 2011, 2012), we hypothesized that individuals who reported high internalization of the college marijuana use culture would report (a) a higher frequency of marijuana use, (b) greater marijuana-related consequences, (c) modestly higher descriptive norms, and (d) moderately higher injunctive norms. Similarly, we expected to find these associations at the institutional level.

Method

Participants and procedure

College students ($N = 8,141$) were recruited from psychology department participant pools at 11 participating universities in 11 different states (Washington, California, Wyoming, Colorado, New Mexico, North Dakota, Kansas, Texas, New York, Virginia, Alabama) in the United States during fall 2015 and spring 2016 (for additional information, see Pearson et al., 2016). Participants read an informed consent before completing the survey online and were awarded research participation credit.

Measures

Perceived importance of marijuana to the college experience. The Perceived Importance of Marijuana to the College Experience Scale (PIMCES) was developed in the present study to assess the degree to which marijuana is perceived to be an integral part of the college experience. Based on the 15-item CLASS measure (Osberg et al., 2010), we created 13 items by replacing “drinking” or “alcohol use” with “marijuana” or “marijuana use.” Two items were dropped that were not relevant to the marijuana use context. Items were provided on a 5-point response scale (1 = *strongly disagree*, 5 = *strongly agree*; see Table 1 for items).

Marijuana use. To determine lifetime marijuana user status, we asked, “In your lifetime, have you ever used marijuana in any form?” If participants responded with “yes,” they were branched to two additional questions: (a) “Approximately how many days in your lifetime have you used marijuana?” and (b) “On how many days during the last 30 days did you use marijuana?” If participants responded with 1 or greater to this second question, they were then asked the remainder of the marijuana-related questions.

Marijuana use frequency was determined using a more high-definition measure patterned from the Daily Drinking Questionnaire (Collins et al., 1985). Specifically, each day of the week was broken down into six 4-hour blocks of time (midnight–4 A.M., 4 A.M.–8 A.M., etc.), and participants were asked to report at which times they had used marijuana during a “typical week” and their “heaviest use week” in the past 30 days. From this measure, we created two marijuana use frequency estimates by summing the total number of time blocks for which they reported using during the typical and heaviest use weeks (ranges: 0–42). The original measure has shown adequate reliability and validity in previous research (Dvorak & Day, 2014; Williams et al., 2000). The measure of “heaviest” week has not been used in prior research but was modeled after measures of heavy weekly alcohol use.

Marijuana consequences. Adapted from the Young Adult Alcohol Consequences Questionnaire (Read et al., 2006), the 50-item Marijuana Consequences Questionnaire (Simons et al., 2012) assesses eight domains of marijuana consequences: social-interpersonal consequences, impaired control, negative self-perception, self-care, risk behaviors, academic/occupational consequence, physical dependence, and blackout use. Participants were asked whether they experienced each of these consequences as a result of their marijuana use in the past month (0 = *no*, 1 = *yes*). We used a total score as an indicator of problematic marijuana use.

Marijuana descriptive norms. Marijuana descriptive norms were assessed using the same marijuana use frequency measure to assess one’s own marijuana use (see above). However, the grids for the typical and heaviest use weeks were filled out in reference to the “typical college student.”

Marijuana injunctive norms. Marijuana injunctive norms were assessed with nine items probing perceived approval for three reference groups (“your best friends,” “typical college students,” and “your parents”) for three behaviors (“using marijuana,” “using marijuana daily,” and “using marijuana to get high”). Averaging across the three behaviors, injunctive norms composites were created for the three reference groups.

Results

Descriptives

In our total sample, 53.3% of college students reported having used marijuana in their lifetime, ranging from 42.5% to 63.6% across universities. More than a quarter of the sample (26.2%) reported having used marijuana in the past month, ranging from 15.5% to 38.7% across universities. About 1 in 20 college students (5.8%) reported near daily use of marijuana (i.e., ≥ 20 days of use in the past month), ranging from 2.8% to 9.9% across universities.

TABLE 1. Factor loadings in the development (Sample 1) and validation (Sample 2) samples

No.	Item	Sample 1	Sample 2
1.	Parties or social gatherings with marijuana are an integral part of college life.	.552	–
2.	To get high on marijuana is a college rite of passage.	.699	.663
3.	I would prefer it if my college was not considered a marijuana school.	.359	–
4.	The reward at the end of a hard week of studying should be a weekend of getting high on marijuana.	.726	.699
5.	I think that the students who do not go out to get high on marijuana are not enjoying their college experience.	.598	.626
6.	Missing class due to being stoned from marijuana or recovering from being stoned is part of being a true college student.	.650	–
7.	A college party is not a true college party without marijuana.	.733	.726
8.	Marijuana is not an important aspect of college life.	.217	–
9.	Attending parties with marijuana is the easiest way to make friends.	.744	.770
10.	Using marijuana is a social event in which every college student partakes.	.768	.775
11.	College is a time for experimentation with marijuana.	.772	.714
12.	It is okay to get high on marijuana in college, even if is not legal.	.679	–
13.	The chance to get high on marijuana and party in college is just as important as the academic experience.	.736	.716

Note: No. = number.

Development sample

Given that there is support for a single-factor structure of the CLASS, we tested the factor structure of the PIMCES using confirmatory factor analysis. We randomly split our total sample into development ($n = 4,008$) and validation samples ($n = 4,086$). In the development sample, we used modification indices to make iterative changes to the model.

In the model with the original 13 items, model fit was poor on many indices, $\chi^2(65) = 3,261.44$, $p < .001$ (comparative fit index [CFI] = .867; Tucker–Lewis index [TLI] = .840; standardized root mean square residual [SRMR] = .054; root mean square error of approximation [RMSEA] = .111). We dropped one item at a time based on modification indices and examined the model fit again. After dropping four items, we had a nine-item measure that demonstrated good model fit with a single-factor structure, $\chi^2(27) = 429.26$, $p < .001$ (CFI = .973; TLI = .965; SRMR = .023; RMSEA = .061). However, one item had a very low factor loading; therefore, we dropped one additional item, leading to an eight-item measure, $\chi^2(20) = 379.40$, $p < .001$ (CFI = .976; TLI = .966; SRMR = .026; RMSEA = .067).

Validation sample

Given that reliance on modification indices can result in sample-specific improvements in model fit, we examined the modified eight-item PIMCES in the validation sample. We were able to confirm that the single-factor, eight-item PIMCES demonstrated good model fit on most indices, $\chi^2(20) = 508.37$, $p < .001$ (CFI = .967; TLI = .953; SRMR = .026; RMSEA = .077). All factor loadings in the final model were greater than .60 (Table 1).

Construct validity

To examine the construct validity of the eight-item PIMCES, we computed the mean of these items in the full sample. The scale had excellent internal consistency ($\alpha = .892$). We examined the construct validity of the PIMCES at both the site level and the individual level (see Table 2 for correlations and descriptive statistics). At the individual level, we found that the PIMCES was positively related to lifetime user status, past-month user status, and near-daily user status in the full sample. Among lifetime users, the PIMCES was positively associated with past-month frequency of use; among past-month users, the PIMCES was positively associated with typical marijuana frequency, heaviest marijuana frequency, and marijuana consequences.

In the full sample, the PIMCES was not significantly correlated with typical descriptive norms and demonstrated a weak, significant relationship with heaviest descriptive norms. The PIMCES was significantly associated with all three injunctive norms measures in the small-to-medium effect size range.

Although somewhat underpowered, we observed some large correlations between the average PIMCES score and average marijuana use involvement variables at the site level. For example, there were significant correlations between the average PIMCES score at a site and past-month user status ($\rho = .651$, $p = .030$), past-month frequency ($\rho = .648$, $p = .031$), best-friends injunctive norms ($\rho = .731$, $p = .011$), and parental injunctive norms ($\rho = .668$, $p = .025$).

Discussion

The present study aimed to develop and validate a measure of the internalization of college marijuana use culture.

TABLE 2. Individual-level and site-level correlations among study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. PIMCES	–	.52	.65	.49	.65	-.23	.06	-.04	.04	.06	.73	.30	.67
2. Lifetime user (0 = no, 1 = yes)	.38	–	.83	.86	.80	.02	.23	.34	.29	.61	.94	.77	.84
3. Past-month user (0 = no, 1 = yes)	.39	.56	–	.69	.83	-.05	-.12	-.05	-.20	.13	.88	.44	.75
4. Near-daily user (0 = no, 1 = yes)	.26	.23	.42	–	.91	.17	.53	.56	.43	.66	.79	.67	.88
5. Past-month frequency	.33	–	.57	.89	–	.26	.40	.42	.20	.42	.82	.50	.87
6. Typical frequency	.26	–	–	.67	.75	–	.57	.68	.32	.36	-.02	.04	-.05
7. Heaviest frequency	.22	–	–	.65	.73	.86	–	.94	.84	.73	.16	.41	.29
8. Consequences	.24	–	–	.29	.35	.35	.35	–	.81	.80	.21	.44	.35
9. Typical descriptive norms	.02	-.04	-.14	.01	.00	.31	.24	.06	–	.87	.24	.67	.25
10. Heaviest descriptive norms	.07	.00	-.01	.12	.16	.37	.42	.15	.54	–	.51	.84	.48
11. Best-friends injunctive norms	.43	.48	.45	.28	.37	.30	.32	.05	.06	.12	–	.75	.82
12. Typical college student injunctive norms	.20	.24	.17	.09	.08	.07	.06	-.07	.17	.16	.55	–	.57
13. Parental injunctive norms	.32	.26	.26	.23	.26	.23	.25	.01	.00	.06	.38	.16	–
<i>M</i>	1.92	0.53	0.26	0.06	4.70	5.86	6.78	8.10	11.03	10.34	3.91	4.80	1.90
<i>SD</i>	0.79	0.50	0.44	0.23	8.44	6.92	8.45	7.83	8.27	9.31	1.84	1.42	1.24

Notes: Individual-level correlations are below the diagonal ($n_s = 2,116-8,141$); site-level correlations are above the diagonal ($n = 11$). Significant correlations ($p < .05$) are in **bold** typeface for emphasis. PIMCES = Perceived Importance of Marijuana to the College Experience Scale.

An examination of means on the PIMCES compared with those on the CLASS (Osberg et al., 2010; Pearson & Hustad, 2014) demonstrates that college students are significantly less likely to view marijuana use, compared with alcohol use, as an integral part of the college experience. However, we found positive associations between PIMCES scores and marijuana-related outcomes at both the site and individual levels of analysis. Thus, the present study offers preliminary evidence that the PIMCES taps into an important construct predictive of increased marijuana involvement.

From an etiological perspective, the examination of internalization of college substance use culture is important, given that these norms appear to have a unique role in predicting substance-related outcomes above the effects of other commonly examined normative perceptions. For example, the CLASS has been shown to mediate the effects of personality on alcohol-related outcomes (Hustad et al., 2014; Pearson & Hustad, 2014), suggesting that these beliefs are proximal antecedents that may help to explain why certain traits place individuals at risk. The CLASS has also been shown to mediate the effects of exposure to pro-drinking college movies on alcohol-related outcomes, such that exposure to these movies results in higher internalization of college drinking culture, which in turn results in higher risk for alcohol use/problems (Osberg et al., 2012).

From a clinical perspective, our findings may suggest an additional target for brief interventions for college student marijuana use. The efficacy of personalized normative feedback for marijuana use in this population has not been strong (e.g., Lee et al., 2010). Perhaps targeting the internalization of college marijuana use culture directly in a comprehensive, norms-based intervention would improve the efficacy of such interventions. For example, an intervention could compare and highlight the discrepancy between one's own internalization of college marijuana use culture and the "typical"

college student. Alternatively, it is plausible that existing interventions may modify these college-related marijuana beliefs and that the PIMCES taps into a possible mediator of college student marijuana interventions.

Limitations

As a preliminary investigation examining the psychometric properties and construct validity of the PIMCES, we did not collect longitudinal data to allow us to examine the prospective prediction of marijuana-related outcomes from the PIMCES. Longitudinal and experimental studies are needed to better estimate any causal effects of the PIMCES on marijuana-related consequences. For example, future studies could examine whether PIMCES scores mediate the effects of personality traits (Pearson & Hustad, 2014), exposure to pro-marijuana media (Osberg et al., 2012), and brief interventions.

One of the strengths of the present study was the large sample obtained from several universities; however, our sample is not representative of the population of college students in the United States, leading to concerns regarding generalizability of our findings. Although we split our sample into development and validation samples to test the factor structure of the PIMCES, a stronger approach involves collecting an independent sample following initial psychometric testing.

Another limitation is that we modified all items directly from an alcohol measure, the CLASS (Osberg et al., 2010), which focuses largely on "going out" and "socializing." We did not go through a process of generating unique items based on focus groups with college students or consulting with experts in the field. For example, given that solitary marijuana use may be more normative than solitary alcohol use (Tucker et al., 2014), our measure is limited by

not including items that address the degree to which using marijuana in nonsocial settings is considered an integral part of the college experience. Furthermore, although all items referenced the importance of marijuana use to the college experience, we did not directly distinguish between internalization of college marijuana use culture from the internalization of broader, societal marijuana use culture. Stronger validation of this construct would test whether internalization of college marijuana use culture specifically predicts marijuana-related outcome above and beyond internalization of societal marijuana use culture.

Conclusion

In sum, this investigation used a large and geographically diverse sample of college students to develop and validate a new measure of the internalization of college marijuana use culture. Consistent with hypotheses, a single-factor structure was identified and subsequently confirmed in large-sample (i.e., $N > 4,000$) factor analyses. With respect to construct validity, the PIMCES was significantly associated in predicted directions with marijuana use and outcomes. Furthermore, although mostly unrelated to descriptive norms of marijuana use, the PIMCES was consistently associated with injunctive norms as predicted, consistent with previous research suggesting a stronger association between injunctive norms and these college-related substance beliefs (Hustad et al., 2014; Osberg et al., 2012). We reason that injunctive norms should be more closely aligned with internalization of college marijuana use culture as they reflect perceptions of peer approval of marijuana use rather than actual use patterns—which perceivers often misjudge.

Future research should seek to further characterize the nomological network for the PIMCES to better characterize the convergent/divergent validity of this construct. Ideally, these studies should use longitudinal and experimental designs that overcome the limitations of the present study. The oft-demonstrated influence of perceived peer substance use on personal substance use (e.g., Prentice & Miller, 1993) coupled with legislative changes in marijuana laws and regulations make this a particularly timely and potentially fruitful measure for marijuana researchers.

References

- Baer, J. S., Stacy, A., & Larimer, M. (1991). Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol*, *52*, 580–586. doi:10.15288/jsa.1991.52.580
- Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol*, *64*, 331–341. doi:10.15288/jsa.2003.64.331
- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology*, *24*, 201–234. doi:10.1016/S0065-2601(08)60330-5
- 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. doi:10.1037/0022-006X.53.2.189
- Connor, M., & McMillan, B. (2010). Interaction effects in theory of planned behavior: Studying cannabis use. *British Journal of Social Psychology*, *38*, 195–222. doi:10.1348/014466699164121
- Dvorak, R. D., & Day, A. M. (2014). Marijuana and self-regulation: Examining likelihood and intensity of use and problems. *Addictive Behaviors*, *39*, 709–712. doi:10.1016/j.addbeh.2013.11.001
- Hustad, J. T. P., Pearson, M. R., Neighbors, C., & Borsari, B. (2014). The role of alcohol perceptions as mediators between personality and alcohol-related outcomes among incoming college-student drinkers. *Psychology of Addictive Behaviors*, *28*, 336–347. doi:10.1037/a0033785
- Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: Examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors*, *18*, 203–212. doi:10.1037/0893-164X.18.3.203
- Lee, C. M., Neighbors, C., Kilmer, J. R., & Larimer, M. E. (2010). A brief, web-based personalized feedback selective intervention for college student marijuana use: A randomized clinical trial. *Psychology of Addictive Behaviors*, *24*, 265–273. doi:10.1037/a0018859
- Lewis, M. A., & Neighbors, C. (2006). Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health*, *54*, 213–218. doi:10.3200/JACH.54.4.213-218
- Martens, M. P., Page, J. C., Mowry, E. S., Damann, K. M., Taylor, K. K., & Cimini, M. D. (2006). Differences between actual and perceived student norms: An examination of alcohol use, drug use, and sexual behavior. *Journal of American College Health*, *54*, 295–300. doi:10.3200/JACH.54.5.295-300
- Napper, L. E., Kenney, S. R., Hummer, J. F., Fiorot, S., & LaBrie, J. W. (2016). Longitudinal relationships among perceived injunctive and descriptive norms and marijuana use. *Journal of Studies on Alcohol and Drugs*, *77*, 457–463. doi:10.15288/jsad.2016.77.457
- Neal, D. J., & Carey, K. B. (2004). Developing discrepancy within self-regulation theory: Use of personalized normative feedback and personal strivings with heavy-drinking college students. *Addictive Behaviors*, *29*, 281–297. doi:10.1016/j.addbeh.2003.08.004
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs*, *68*, 556–565. doi:10.15288/jsad.2007.68.556
- Neighbors, C., Geisner, I. M., & Lee, C. M. (2008). Perceived marijuana norms and social expectancies among entering college student marijuana users. *Psychology of Addictive Behaviors*, *22*, 433–438. doi:10.1037/0893-164X.22.3.433
- Osberg, T. M., Atkins, L., Buchholz, L., Shirshova, V., Swiantek, A., Whitley, J., . . . Oquendo, N. (2010). Development and validation of the College Life Alcohol Salience Scale: A measure of beliefs about the role of alcohol in college life. *Psychology of Addictive Behaviors*, *24*, 1–12. doi:10.1037/a0018197
- Osberg, T. M., Billingsley, K., Eggert, M., & Insana, M. (2012). From *Animal House* to *Old School*: A multiple mediation analysis of the association between college drinking movie exposure and freshman drinking and its consequences. *Addictive Behaviors*, *37*, 922–930. doi:10.1016/j.addbeh.2012.03.030
- Osberg, T. M., Insana, M., Eggert, M., & Billingsley, K. (2011). Incremental validity of college alcohol beliefs in the prediction of freshman drinking and its consequences: A prospective study. *Addictive Behaviors*, *36*, 333–340. doi:10.1016/j.addbeh.2010.12.004
- Pearson, M. R., & Hustad, J. T. P. (2014). Personality and alcohol-related outcomes among mandated college students: Descriptive norms, injunctive

- tive norms, and college-related alcohol beliefs as mediators. *Addictive Behaviors*, 39, 879–884. doi:10.1016/j.addbeh.2014.01.008
- Pearson, M. R., Liese, B. S., Dvorak, R. D., & Marijuana Outcomes Study Team (2016). *College student marijuana involvement: Perceptions, use, and consequences across 11 college campuses*. Manuscript submitted for publication.
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, 64, 243–256. doi:10.1037/0022-3514.64.2.243
- Read, J. P., Kahler, C. W., Strong, D. R., & Colder, C. R. (2006). Development and preliminary validation of the young adult alcohol consequences questionnaire. *Journal of Studies on Alcohol*, 67, 169–177. doi:10.15288/jsa.2006.67.169
- Silvestri, M. M., & Correia, C. J. (2016). Normative influences on the nonmedical use of prescription stimulants among college students. *Psychology of Addictive Behaviors*, 30, 516–521. doi:10.1037/adb0000182
- Simons, J. S., Dvorak, R. D., Merrill, J. E., & Read, J. P. (2012). Dimensions and severity of marijuana consequences: Development and validation of the Marijuana Consequences Questionnaire (MACQ). *Addictive Behaviors*, 37, 613–621. doi:10.1016/j.addbeh.2012.01.008
- Tucker, J. S., Pedersen, E. R., Miles, J. N. V., Ewing, B. A., Shih, R. A., & D'Amico, E. J. (2014). Alcohol and marijuana use in middle school: Comparing solitary and social-only users. *Journal of Adolescent Health*, 55, 744–749. doi:10.1016/j.jadohealth.2014.06.015
- Williams, C. D., Adams, S. E., Stephens, R. S., & Roffman, R. (2000, November). *Varied methods of assessing marijuana use and related problems: Validity analyses*. Paper presented at the 34th annual convention of the Association for the Advancement of Behavior Therapy, New Orleans, LA.
- Young, C. M., Neighbors, C., DiBello, A. M., Sharp, C., Zvolensky, M. J., & Lewis, M. A. (2016). Coping motives moderate efficacy of personalized normative feedback among heavy drinking U.S. college students. *Journal of Studies on Alcohol and Drugs*, 77, 495–499. doi:10.15288/jsad.2016.77.495