The Impact of Personalized Feedback on Marijuana Use:
Examining a Brief Intervention Delivered via the Internet

Sheri Lynn Towe

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Robert S. Stephens, Committee Chair

George A. Clum

Jungmeen Kim-Spoon

Richard A. Winett

Virginia Polytechnic Institute and State University

Blacksburg, VA

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Abstract

Marijuana use remains the most commonly used illicit drug in the United States, and many people experience problems related to their marijuana use yet do not seek treatment. Web-based interventions for problematic marijuana use represent a potentially cost-effective and highly accessible way to reach a large number of adults who are ambivalent about changing their marijuana use, or are concerned about seeking in-person counseling for their use. The goal of this online study was to evaluate the effectiveness of a brief web-based feedback intervention for adult marijuana users who reported at least some problems related to their marijuana use. Eighty-two adult college students who reported at least some problems related to marijuana use at baseline were randomized to one of two conditions to examine whether a personalized feedback report would impact marijuana use at follow-up relative to an education control group. Feedback reports were delivered to participants after completion of a baseline assessment battery, and participants were reassessed at one- and three-months post-baseline. Primary outcome variables were problems related to marijuana use and frequency of marijuana use. Main outcome analyses examined change over time by condition as well as possible moderating variables of Stage of Change and family history of problematic substance use. Both marijuana-related problems and marijuana use rates showed some indication of reduction over time at the one-month follow-up, but there were no significant interactions by condition indicative of differential change. These reductions were not sustained at three-months. Analyses across the final follow-up period were likely not significant due to low follow-up completion rates, as well as an overall lower-than-expected sample size. Study recruitment will continue for one additional year to increase sample size for future analyses, but at this time there was no clear evidence the personalized feedback intervention was effective.

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Table of Contents

Acknowledgements iii
Table of Contents iv
Background and Significance 1
Methods 11
Results 26
Discussion 34
References 41
Tables
Table 1: Means and standard deviations for screening variables amongst enrolled participants versus those who chose not to enroll 50
Table 2: Means and standard deviations for participant characteristics across conditions 51
Table 3: Means and standard deviations for post-baseline questionnaire 52
Table 4: Means and standard deviations for participant characteristics across conditions over time 53
Table 5: Means and standard deviations for participant characteristics across conditions over time, for follow-up completers only 54
Table 6: Participant characteristics by condition and Stage of Change over time 55
Table 7: Participant characteristics by condition and family history of substance abuse over time 56
Appendices
Appendix A: Consent Form for Screening Assessment 57
Appendix B: Consent Form for Study Enrollment 60
Appendix C: Sample Personalized Feedback Report 63
Appendix D: Sample Education Control Report 71
Appendix E: Screening Assessment 77
Appendix F: Cannabis Use Problems Identification Test 78
Appendix G: Demographics Questionnaire 82
Appendix H: Assessment of Marijuana, Alcohol, and Other drug use 83
Appendix I: Family History of Drug Problems 87
Appendix J: Treatment Utilization Questionnaire 88
Appendix K: MPI 89
Appendix L: Abuse and Dependence Symptom Assessment 91
Appendix M: Marijuana Motives Measure 93
Appendix N: Self-Efficacy Scale 94
Appendix O: Life Goals Assessment 95
Appendix P: Marijuana Goals Assessment 96
Appendix Q: Manipulation Check 98

Background and Significance

Introduction

Epidemiological data compiled by the Substance Abuse and Mental Health Services Administration indicates that 6.8% of adult Americans used marijuana in the previous month in 2010, making marijuana the most commonly used illicit drug in America (SAMHSA, 2012). Over one-third of current users reported using marijuana 20 or more days in the past month. Based on the current Diagnostic and Statistical Manual of Mental Disorders - Fourth edition (DSM-IV; American Psychiatric Association, 1994) criteria, 1.7% of adult Americans were dependent on or abused marijuana in the past year. Both the Epidemiological Catchment Area (ECA; Anthony & Helzer, 1991) and the National Comorbidity Study (NCS; Anthony, Warner, & Kessler, 1994) estimate that slightly more than 4% of the population develops a dependency on marijuana at some point in their lifetime. Additionally, two national epidemiological surveys conducted 10 years apart indicate the prevalence of dependence and abuse diagnoses based on the DSM-IV criteria have significantly increased despite rates of past year use having remained stable (Compton, Grant, Colliver, Glantz, & Stinson, 2004). Approximately 9% of those who have ever used marijuana meet criteria for a diagnosis of dependence at some time (Anthony et al., 1994). There are a number of adverse health and psychological consequences resulting from heavy marijuana use, including chronic respiratory problems and potential cognitive deficits (see Iverson, 2000; Snyder, 1992; Kalant, Corrigall, Hall, & Smart, 1999; Tashkin, 1999 for reviews).

General estimates of how many people received treatment for a substance use problem indicate that approximately 11% of people reporting substance-related problems received specialized treatment (SAMHSA, 2012). Among those who did not receive treatment but felt that they needed treatment, the six primary reasons reported for not receiving treatment were: (a) not

ready to stop using, (b) no health coverage and could not afford cost, (c) possible negative effect on job, (d) concern that receiving treatment might cause neighbors/community to have negative opinion, (e) could handle the problem without treatment, and (f) not knowing where to go for treatment. These data indicate that there is a significant unmet need for substance use interventions designed to motivate a person to recognize problematic substance use but also to provide them a safe, secure, accessible environment for intervention which will not stigmatize them or negatively impact their lives. Such an intervention is particularly relevant for marijuana users, because marijuana use is prevalent but also illegal. There are many self-help web-sites on the internet which advertise themselves as being helpful for individuals seeking to reduce their marijuana use, but these sites have not been adequately evaluated for effectiveness. Hence, there is a need for empirically supported internet interventions for marijuana use.

Internet-based Interventions

The internet is widely used as a primary source of health information by people of all ages, and most people using the internet consider it a trusted source of information (Bennett & Glasgow, 2009; Taylor & Luce, 2003). Survey data indicates that approximately 74% to 79% of all American adults use the internet, and of those adult Americans who do use the internet, approximately 80% to 88% look online for health information (Fox, 2011; Taylor, 2010). Web-based Interventions, or E-interventions, have been examined in other health areas (anxiety disorders, obesity, mood disorders, cigarette smoking, alcohol use; Copeland & Martin, 2004) but have not been extended to marijuana use (or more generally, illicit drug use). The web presents an opportunity to access individuals who may be in the early stages of problematic substance use or who otherwise might not come for in-person assessment and intervention. In

general, research has shown that there is a market for E-interventions which target substance use disorders.

There are a number of advantages associated with web-based interventions (Atkinson & Gold, 2002; Copeland & Martin, 2004; Taylor & Luce, 2003). First, because the internet represents an environment of relative anonymity, people appear to feel comfortable providing information about themselves. The internet also provides ample opportunity to tailor and individualize content, and standardized web content can ensure treatment fidelity. In addition to being an interactive and engaging medium, the internet is highly accessible and therefore represents an opportunity to reach people who otherwise would not receive any type of treatment. The internet medium provides immediate access to treatment with no wait-list or delay. Web-based interventions provide 24-hour access such that people can receive treatment at any time, and collection of information via the web provides real-time process and outcome data capture. Finally, web-site interventions are cost-effective. They require little to no therapist time, provide remote delivery to large numbers, and require fewer resources than traditional in-person interventions.

There are also a number of potential disadvantages associated with web-based interventions. First, it is not possible to ensure attention to content that is presented, and individuals may self-select what content they attend to. It is also difficult to ensure that individuals who receive an internet intervention comply with components of the intervention. Accessibility for some populations is also a concern. The utility of web-based interventions is limited for people who are not comfortable using computers or who are unable to access the internet. Finally, completing the intervention via the web involves a loss of face-to-face interaction and other interpersonal factors that may impact treatment process (e.g., therapeutic

alliance). Nevertheless, given their relatively low costs and ability to reach many more people, internet interventions deserve continued study.

Personalized Feedback Interventions for Substance Use

The impact of personalized, motivational feedback on substance use is well-documented in the literature (Walters & Neighbors, 2005). Motivational Enhancement Therapy (MET) consists of providing feedback on drug use using motivational interviewing (MI). MET relies on principles of motivational interviewing (MI), as described by Miller and Rollnick (2002). MET has been found to be an effective approach to reducing alcohol and drug use in adults, both as an adjunct to other treatments and as an independent brief intervention (e.g., Brown & Miller, 1993; Davis, Baer, Saxon, & Kivlahan, 2003; Project MATCH Research Group, 1997; Marijuana Treatment Project Research Group, 2004 ; Rohsenow, et al., 1998; Stephens, Roffman, & Curtin, 2000; Stotts, Schmitz, Rhoades, & Grabowski, 2001). A recent meta-analysis of MET indicates overall positive effects with substance abusers (Burke, Dunn, Atkins, & Phelps, 2004). According to Miller and Rollnick (2002), one of the key components of MI is the provision of feedback about use and use-related variables. Recently, many researchers have been examining the impact of personalized feedback in the absence of other MI components. Exposure to feedback is intended to help clients recognize discrepancies related to substance use and accordingly enhance the client's motivation to change their substance use.

Research on Internet-Based Substance Use Interventions

Substance Use Interventions on the web appear to be a viable form of treatment. Cunningham, Selby, Kypri and Humphreys (2006) examined whether internet access was a barrier specifically for substance-using populations. While these researchers found that heavy cigarette smokers were less likely to have internet access than non-smokers, they also found that

current drinkers were more likely to have access than non-drinkers. They did not find any clear association between marijuana use and internet access. These researchers concluded that the majority of substance users do use the internet, and therefore utilizing the internet for substance use interventions presented an opportunity to reach a large population of people who may otherwise not seek treatment. Additionally, assessment of substance use via the internet appears to be reliable, valid, and generally as accurate as data collected in-person (Miller et al., 2002; Ramo, Liu, & Prochaska, 2011). Miller et al. (2002) found significantly high test-retest reliability for web-based assessment data on alcohol use, and these researchers found no significant differences between web-based assessment and traditional paper-and-pencil assessment. Ramo, Liu, and Prochaska (2011) examined self-reported marijuana use by young adults (age 18-25) in an anonymous online survey and found that participant self-reports were generally both reliable and valid.

The majority of internet-based substance use interventions that have been developed have focused specifically on alcohol and cigarette use in college populations, but there have been some studies examining adult populations. A meta-analysis by Riper et al. (2009) examined 14 studies of brief personalized feedback interventions for alcohol use where contact with a therapist was not utilized. These 14 studies consisted of research on adult and college populations. Based on their analysis, the researchers concluded that brief feedback interventions without therapeutic guidance are a viable treatment option, particularly as the first step in a stepped care model. Given that many of the studies included in this analysis utilized web-delivery of feedback, the researchers also concluded that delivery of feedback via the web is a useful way to reach large numbers of people. They also speculated that the effectiveness of feedback is dependent on the actual content of the feedback, rather than the simple distinction of

whether the feedback is delivered in person. In a study examining delivery of a personalized feedback in a face-to-face format versus a computerized format for problematic alcohol use amongst college students, Butler and Correia (2009) found that the two different formats were equally effective in reducing alcohol use, and that both formats were superior to the assessment-only control group.

A qualitative review of 17 studies by Elliott, Carey, and Bolles (2008) examined the effects of computer-based interventions for college drinking. The interventions included web-based interventions as well as CD-ROM- and DVD-based interventions. They concluded that overall these electronic interventions are more effective than no intervention, and appear to be roughly comparable to alternative interventions. However, the studies included usually offered very brief follow-up periods and typically brief interventions. Most studies made few direct comparisons to established interventions (e.g., Cognitive-Behavioral Therapy, Motivational Enhancement Therapy). The content in comparison conditions was often not matched (e.g., exact same material delivered in person vs. on the web). These studies did not offer a systematic evaluation of which components of e-interventions are most effective and these studies were limited to college populations only, often involving volunteer samples.

Two examples of current web-based programs for alcohol interventions are the Drinker's Check-Up (Squires & Hester, 2004) and the Electronic Check-Up To Go (E-Chug; Walters, Vader, & Harris, 2007). The Drinker's Check-Up involves assessment and brief intervention (with personalized feedback) plus a Decisional Balance exercise. In several studies, where participants receiving the Drinker's Check-Up were compared to wait-list control, participants receiving the intervention reduced the quantity and frequency of drinking and alcohol-related problems, and the changes were sustained through 12-months (Hester, Squires, & Delaney, 2005;

Hester, Delaney, & Campbell, 2012). The Electronic Check-Up To Go (E-Chug; Walters, Vader, & Harris, 2007) involves assessment and personalized feedback. Among college students reporting heavy drinking, the intervention produced larger reductions in alcohol use compared to control group receiving assessment only. However, these differences were not sustained at the 4-month follow-up.

In a review of computer- and internet-based interventions for cigarette use, Walters, Wright, and Shegog (2006) report that interventions in seven of 15 studies targeting adults showed improved outcomes compared to control groups at the longest follow-up. Clearly, this review indicates mixed results as far as sustainability for behavior change. In addition, the studies included in this review used a wide-ranging variety of interventions and control groups, and therefore it is not possible to make conclusions about which specific components were most effective in producing change. The authors concluded that treatment-seekers typically show better outcomes than the general population, but intervention effects lessen over time. They also concluded that there seem to be no cases where the intervention condition had a poorer outcome that the control group.

It is unclear which components of the interventions are active and it is unclear how long those positive outcomes are sustained, but the general consensus about E-interventions for substance abuse is that they lead to better outcomes than control comparison groups (Vernon, 2010). Additionally, a recent review by Newman, Szkodny, Llera, and Przeworski (2011) suggested that, while therapist contact is likely an important factor in creating meaningful, sustained reductions in problematic substance use, there is also evidence that computerized, self-administered interventions are efficacious. Evaluating which components are active in creating

behavior changes is an important step in developing the best possible E-interventions (Collins, Murphy, & Strecher, 2007).

To date, there is no published research regarding brief web-based interventions for illicit drug use among adults. One recently completed study by Lee, Neighbors, Kilmer, and Larimer examined the preventative effects of personalized feedback on college freshmen (Lee et al., 2010). Their intervention was aimed at students ages 17-19 entering their first year of college. Participants were randomized to either a personalized feedback condition or an assessment only control. Participants were recruited via a mailed letter and were invited to complete an online survey. Students were eligible if they had used marijuana at any point in the three months prior to the survey, and the final follow-up assessment was completed at 6-months after enrollment. Though their results showed a lack of intervention effect, it is noteworthy that their participants were not necessarily problematic marijuana users.

In addition, moderator analyses in the Lee et al. study (2010) indicated effects of family history of drug problems, such that participants in the intervention condition with a family history of drug problems reduced their marijuana use more than other participants. Lee et al. concluded that personalized feedback may be more salient for individuals with a family history of drug problems, and therefore they may process the feedback report more actively and in depth. Family history of substance use problems may be an important factor which contributes to substance use disorder severity (Boyd, Plemons, Schwartz, Johnson, & Pickens, 1999). Labrie, Feres, Kenney, and Lac (2009) examined college women who used alcohol, and found a moderating effect such that, among participants who received the intervention, Family History Positive (FH+) participants reported fewer days of alcohol use at follow-up than Family History Negative (FH-) participants. The authors in this study suggested that individuals who endorse a

family history of problematic substance use may develop a unique perspective related to substance use disorders and it may be that having a family history of problematic substance use makes these individuals more receptive to intervention. Specifically, FH+ individuals may develop more awareness and sensitivity to substance abuse and associated problems as a result of their exposure to family members with substance abuse problems. This increased awareness and sensitivity accordingly may make these FH+ participants more likely to recognize their own use patterns and problems as problematic, whereas FH- participants may be more likely to dismiss their problems and use patterns as harmless or transient.

Moderator analyses in the Lee and colleagues (2010) study also indicated effects for stage of change, such that students in the intervention condition who were higher in contemplation changed their marijuana use more than students who were lower in contemplation. One possible explanation posited by the authors is that people who are thinking about change are simply better candidates for responding to the personalized feedback, whereas people who are not already thinking about change are not as impacted by the feedback.

The primary aim of this study was to provide empirical support for the effects of a brief web-based intervention for marijuana use. Though there are many web sites available on the internet that purportedly provide assistance for individuals who use marijuana problematically, these sites have not been evaluated or developed scientifically (Taylor & Luce, 2003). In addition, much of the information available on the internet is educational in nature, rather than relying on empirically justified intervention strategies. Given that many people are utilizing the internet for health information, the development of an effective E-Intervention for marijuana use is imperative. Though research in the cigarette and alcohol literatures indicates that brief feedback interventions on the web may be effective, there are currently no empirically validated

web-based interventions for adults which address problematic illicit drug use in general or marijuana specifically. The extension of E-interventions, and more specifically, the use of brief personalized feedback, for marijuana use is a reasonable next step in substance abuse treatment research. E-Interventions represent a way to address problematic marijuana use by reaching a large number of people with minimal cost.

Hypotheses

1) In the current study, the primary hypothesis was that marijuana users who received personalized feedback on their use would report better outcomes than users who received only education about marijuana. These hypothesized improved outcomes included:
    a) a reduction in problems related to marijuana use, and
    b) a reduction in frequency and quantity of marijuana use.
2) It was also hypothesized that stage of change would moderate the effect of condition, such that participants in the precontemplation and contemplation stages of change would show greater reductions in frequency of problems related to marijuana use in the personalized feedback condition than those in later stages of change, while differences by stage of change in the education condition were expected to be less.
3) A test for differential change in the potential moderating variable of family history of drug problems was intended to replicate the findings published by Lee and colleagues (2010) that those with family histories of drug abuse problems would respond more favorably to the feedback intervention.

Methods

Design

The current study utilized a personalized feedback report to encourage participant changes in marijuana use and potentially reduced marijuana-related problems and increase treatment engagement by participants. A comparison condition consisted of a non-personalized, educational report. This study utilized a longitudinal research design with adult marijuana users (age 18 or older). Following informed consent and eligibility determination, a baseline assessment battery was completed online prior to the intervention. At the beginning of the baseline assessment, participants were randomized into one of the two study conditions consisting of either: a personalized feedback report (Personalized Feedback, or PF; n = 41); or non-personalized educational information about marijuana (Education Control, or EC; n= 41). Randomization to condition was accomplished following stratification on stage of change (SOC: Precontemplation vs. Contemplation vs. Preparation/Action/Maintenance) by a randomization algorithm in the web program. A similar assessment battery was completed online at one month and three months after the initial baseline assessment and intervention.

Participants

A total of 82 participants were enrolled in this study, with 41 assigned to the Personalized Feedback condition and 41 assigned to the Education Control condition. Enrolled participants were 19.6 years of age on average and reported 17.4 days of marijuana use in the past month. Participants were mostly male (*N* = 43, 52.4%) and Caucasian (*N* = 72, 87.8%), with 2.4% Asian or Asian American, 1.2% African American, 1.2% Hawaiian or Pacific Islander, and 7.4% Multi-Racial or Other. Six percent of eligible enrolled participants identified as Hispanic or Latino. The majority of participants were either in their first (*N* = 22, 26.8%) or second (*N* = 31,

37.8%) year of college, with 12 (14.6%) participants in their third year and 17 (20.7%) participants in their fourth year or higher. Based on self-reported family history of problematic substance use, 43 participants (52.4%) reported having at least one first degree relative with a history of substance abuse. Based on a stage of change algorithm completed at screening, 33 participants (40.2%) were in the precontemplation stage, 17 (20.7%) were in the contemplation stage, and 32 (39%) were in the preparation, action, or maintenance stages.

Data collection occurred across the Fall 2011 and Spring 2012 academic semesters. Participants were recruited from the student body of Virginia Polytechnic Institute and State University (Virginia Tech). Recruitment methods included on-campus advertisements and posting through the Virginia Tech's SONA online research system through the Department of Psychology. Participants who participated in the screening using the SONA research system were compensated through extra credit for psychology classes, and those who enrolled in the study were entered into a lottery for a $20 gift certificate for completing assessments as baseline and follow-up. Advertisements indicated that this project was for people who have questions about marijuana or wanted to learn more about it. This strategy was intended to allow people to express interest in the study without necessarily being identified or stigmatized as a marijuana user. Eligibility criteria included being at least 18 years old, reporting at least six days of marijuana use in the past 30 days, and endorsing at least one problem associated with marijuana use.

A total 1368 students completed the brief screening assessment. Of these, 162 (11.8%) were eligible. The majority (99.5%) of ineligible participants had not used marijuana on at least 6 days in the past month. Following screening, only 82 of the 162 eligible participants enrolled in the study. It is not clear why so few (50.6%) of the eligible participants chose to enroll, but

this low rate of enrollment was unexpected and therefore the target sample size for this study was not reached. There were no significant differences between eligible participants who enrolled versus those who did not on screening variables (See Table 1 for means and standard deviations of continuous screening variables). While differences between these groups on screening variables were not statistically significant, participants who enrolled did report a higher frequency of marijuana use over the past 30 days (F (1, 160) = 3.62, p = .06) as well as somewhat higher CUPIT scores (F (1, 160) = 2.60, p = .11) when compared to those who did not enroll.

For this study, a target sample size of 184 was predicated on the 2 (Condition) x 3 (Time: Baseline, 1-month, 3-month) interaction effect on the number of marijuana-related problems in the prior 30 days from baseline assessment to the 3-month follow-up assessment. Given the brief follow-up period, the student-based population, incentivized follow-ups, and the precedent set by the Lee et al. study, attrition was expected to be low. The estimated effect size of .22 (classified as a small effect size) was based off the meta-analysis on similar brief interventions for alcohol reported by Riper et al. (2009). The target sample size estimate included an allowance for 10% attrition at the 3-month follow-up and a small effect size. With this sample size, the power to detect a small effect would be approximately .80 in a mixed model GLM analysis, assuming alpha = .05, using the GPower computer program (G*Power 3; Faul, Erdfelder, Lang, & Buchner, 2007). While the full model analyzed included a moderator (Stage of Change, Family History) as a between-subjects factor, these factors were not included as factors in the power analysis for simplification. Under most circumstances, including a moderator would be expected to increase power by accounting for additional error variance. Using the above parameters and

the actual enrolled sample size of 82, the G*Power program calculated actual power to detect the expected small effect size as 0.49 for the current sample.

Procedure

Development and Utilization of the Assessment and Intervention Program. The first phase of the study involved the design and programming of the online assessment and intervention interface that participants would access. A web programmer was hired to program the website. The programmer ensured that the website collected and stored data securely to protect confidentiality and privacy of participant information in accordance with guidelines set by the Institutional Review Board of Virginia Tech. The web program was accessed by logging on to a secured server from any computer with web access. All information transferred between client and server machines was secured using 128-bit encrypted Secure Sockets Layer (SSL). A random number was assigned to each participant, and the survey tool created a code translation that was linked to the participant's e-mail address. The data was accessible only to the data manager, who downloaded participant data from the survey website, and converted comma-delimited files into SPSS files for analyses. The data manager monitored the website daily, checked the project e-mail account daily, and performed weekly data downloads. After download, data files were cleaned by the data manager and prepared for later analysis.

The website was designed to be visually interesting and engaging. Assessments were also designed to minimize potential measurement error (e.g., unambiguous response modes, forced-choice question format; Dillman & Smyth, 2007). Researchers have pointed out that the quality of the website itself can impact the site's effectiveness, because internet users may quickly navigate away from the program if it is unappealing or does not function correctly (Cheh, Ribisl, & Wildemuth, 2003; Stoddard, Augustson, & Mabry, 2006). Hence, formal usability testing is a

necessary component of website development. Prior to initiation of study recruitment, the website was tested for usability by ten pilot participants to evaluate the web program. Pilot testers were unpaid volunteers who agreed to complete the study components online and then provide feedback about their experience while using the web program. The feedback about their perceptions of the web program included its usability, functionality, how appealing the presentation was, and how satisfied they were (e.g., positive feelings or opinion of the site). Pilot participants were generally quite satisfied with the program. Some minor modifications to the program were made based on the feedback received during usability testing, including some specific technical aspects of the program's functioning and specific item instructions that were unclear.

Screening. The website introduction page emphasized that the study was a nonjudgmental and confidential service for people who wanted information related to their use of marijuana. It was clearly stated to participants that participation in the study was free and that there was potential to earn incentives for enrolling in the study. The introductory web page provided a brief description of the study and an invitation to complete eligibility screening. After completing the eligibility screen, participants were informed of their eligibility status. Ineligible participants were thanked for their time and offered resources on the web about marijuana and treatment resources. Eligible participants were directed to a page which informed them that they would be contacted in 24 hours by email with information about how to enroll into the study. This imposed delay in access to the baseline assessment was an attempt to reduce later attrition. It was expected that individuals who only casually completed the screening without any genuine interest in evaluating their marijuana use would not continue to pursue participation in the study after the 24 hour delay. Participants were asked to provide a valid e-mail address which they

planned to use over the next three months for future contact, but were not required to disclose their names or other identifying information. Additional contact information beyond an e-mail address, such as a phone number or mailing address, was not obtained in order to minimize disclosure of identifying information by the participant.

Consent Procedures. Participants provided their informed consent via digital signature after reviewing the consent information (see Appendix A for screening consent form and Appendix B for study enrollment consent form). Participants were provided with the investigator's e-mail address to which they could send any inquiries about the consent process. In addition, the participants were required to affirm that they read the consent material, that they understood it, and that they were given the opportunity to ask questions. This procedure ensured that the informed consent process was completed in accordance with IRB guidelines (Ahern, 2007). Participants were told that all information collected was kept confidential and that they had the right to discontinue participation or refuse to answer questions at any time without penalty.

While acquiring informed consent, participants were briefed on the two potential conditions for random assignment. Participants were informed that both groups would complete the baseline assessment, receive a report after the assessment, and be asked to participate in follow-ups at one- and three-months post-baseline. Participants were also informed about the incentive payment schedule for completing assessment batteries. Incentives were provided based on a lottery where participants had the potential to earn gift certificates worth $20 at each assessment, as well as a "bonus" lottery drawing for completing all three assessments. Lottery drawings were random and were conducted such that 5% of assessment completers won. Participants were informed that their odds of winning were therefore "1 in 20." When

participants won a lottery, they were alerted via the e-mail address they provided for project contact. They had the option of either (1) receiving an electronic gift code through email to an online retailer or (2) providing a mailing address in a reply e-mail where their gift certificate will be mailed. This compensation in part was meant to minimize attrition by incentivizing participants to continue in the study.

Baseline Assessment. Randomization occurred when the participant logged in to complete the baseline assessment. The two groups for randomization were as follows: (1) The Personalized Feedback (PF), and (2) The Education Control (EC).The web program performed automated randomization with participants blocked on Stage of change (3 groups: Precontemplation, Contemplation, Preparation/Action/Maintenance).

Twenty-four hours after eligibility determination, participants received an e-mail which directed them to the project website in order to complete the baseline assessment. The e-mail provided a secure web address and a pass code that the participants used to gain entry into the baseline assessment site. After entering the pass code, algorithms built in to the website code randomized the participant to one of the two conditions. Participants' web browsers were then directed to the baseline web assessment.

Providing the Report. Following completion of the baseline assessment, the web program automatically generated the appropriate report based on randomization. The report was delivered immediately following completion of the baseline assessment. To help ensure that participants were reading through the entire report, several "check-in" questions were imbedded at points throughout the report (e.g., "Do you think this information is accurate?" or "What do you think about this information?"). The report remained accessible following the baseline, such

that participants were able to view their report again by logging in to the website with their passcode.

Personalized Feedback. Participants in the PF condition received a personalized feedback report (PFR; see Appendix C for example PF report). Personalized Feedback consisted of specific, normative feedback provided based on the participant's responses to assessments of marijuana use, marijuana-related problems, and other relevant variables. The goal of providing this type of feedback was to correct potential misperceptions about actual norms, with this correction subsequently facilitating behavior change. The PFR utilized normative information to show how the participant's marijuana use compares to others his or her age. There were also graphics showing the participants their reported amount of time spent using marijuana, amount of money spent on marijuana, and other variables related to their marijuana use. The participant's reported marijuana problems (from the Marijuana Problems Index and the Cannabis Use Problems Identification Test) were also presented to the participant. Participants reviewed what they reported related to self-efficacy and motives for marijuana use. The participant's top five life goals were presented, along with their rating on how their marijuana use impacts these goals. For this study, the design and content of the PFR was modeled after PFRs that have been used in other brief motivational interventions for marijuana users, including the PFR used in the Lee et al. (2010) online study and PFRs used in face-to-face interventions (Walker, Roffman, Stephens, Berghuis, & Kim, 2006; Walker et al., 2011).

Education Control. Participants in the EC condition received educational information about marijuana. The Education Control report about Marijuana consisted of general information about marijuana (see Appendix D for EC report). The feedback provided was non-personalized information about the pharmacological, health, and social effects of marijuana use. This

provision of general information was intended to control for the amount of content provided to participants. The EC report was designed to offer participants a visually interesting educational experience on the effects of marijuana on human health and psychosocial functioning. The report provided recent, accurate information about marijuana without providing the participant any personalized feedback. The Education Control report was modeled after a similar control intervention created for an earlier National Institute on Drug Abuse funded trial conducted by the applicants with marijuana-using adults ("Motivating Marijuana Cessation;" RO1 DA09425). Information contained in the EC report was obtained from NIDA's information page about marijuana (NIDA, 2009).

Post-Feedback. After viewing the report, participants completed a brief process questionnaire as a manipulation check to assess how they experienced the report. Using a 5-point Likert scale (1= strongly disagree, 5 = strongly agree), participants rated their level of agreement with statements related to their reaction to the report they viewed, and they also rated their level of agreement for statements regarding the content of the report they viewed. It was expected that participant patterns of responses to these questions would differentiate the two conditions, showing that the PF and EC reports were experienced as qualitatively different. At the end of this questionnaire, participants were directed to a final web page where they were reminded of the upcoming follow-up assessments. This reminder included providing them with the projected target date for the follow-up and informing them that they would receive an e-mail to remind them when the target date approaches. They were reminded that completing the baseline session allowed them to enter a lottery for a gift certificate.

Additionally, after viewing feedback, participants were provided with information for outside resources which they could utilize if they desired. Participants were not assessed

regarding their mood, anxiety, or other psychological/emotional problems beyond their reported problems related to marijuana use. However, because the information obtained by the assessment measures could be potentially upsetting for participants to report, several resources were provided after the completion of the baseline assessment and report viewing. Participants were given the phone number of a crisis hotline (National Suicide Prevention Lifeline) which they could call if they felt distressed. Participants were also given a link to a website which could help them locate mental health services in their area (the Substance Abuse and Mental Health Services Administration's Mental Health Services Locator, http://mentalhealth.samhsa.gov/databases/) and a list of local mental health services.

Participants were also provided with links for marijuana treatment resources if they were interested in locating marijuana treatment services in their area. Links were provided to the Marijuana Anonymous website (http://www.marijuana-anonymous.org/) and the "Substance Abuse Treatment Facility Locator" sponsored by the Substance Abuse and Mental Health Services Administration (http://findtreatment.samhsa.gov/).

Follow-up Assessments. All participants were informed that follow-up assessments would occur at one-month and three-months after the baseline assessment. For each follow-up, participants were contacted using the e-mail addresses they provided and given information on how to complete the follow-up questionnaires. The target completion date for the 1-month follow-up was 30 days after the baseline assessment, and the target completion date for the 3-month follow-up was 90 days after the baseline assessment. The assessment period for the one- and three-month follow-ups was two weeks long, such that participants had 14 days from notification on their target date to complete the assessment. In the e-mail invitations, participants were reminded of the incentives for completing follow-ups. Participants received an initial e-

mail prompt to participate in the follow-up on the target date. If the follow-up was not completed, they were sent two subsequent reminders on seven and ten days post-target date as additional prompts to complete the follow-up questionnaires.

At both the one- and three-month follow-ups, participants completed an abbreviated version of the baseline assessment. Some of the measures that were included only to provide material for the PFR were not repeated. Each follow-up assessment was estimated to take 30-45 minutes to complete. At each follow-up, the time frame for recall of all assessment measures was the past 30 days.

Measures

The choice of assessment measures was guided by the need to measure key marijuana use variables, potential mediators and moderators of intervention effects, and features of marijuana use needed to generate the Personalized Feedback Report. All assessment measures, including baseline and follow-ups, were completed online via the internet. The Personalized Feedback Report was automatically generated based on the participant's responses to the questionnaires. The full assessment battery administered at baseline took approximately forty-five minutes to one hour to complete.

Brief Screening Assessment. Participants completed the brief Screening Assessment (Appendix E) after navigating to the project website. Participants reported their age and indicated the number of days they had used marijuana in the past 30 days. Embedded in the screening assessment was the Cannabis Use Problems Identification Test (CUPIT; please see below for full description of the measure). The participant's Stage of Change was determined by a single item question asking the participant to rate how he or she feels about their marijuana use at the present time. Prior research indicates that the SOC algorithm is as predictive of change as longer, multi-

scale assessment instruments, and was more efficient given the limited time for screening assessment.

Cannabis Use Problems Identification Test (CUPIT). The CUPIT (Bashford, Flett, & Copeland, 2010) is a brief self-report screening instrument for detection of problematic marijuana use (Appendix F). The CUPIT is composed of two subscales, (1) Impaired Control and (2) Problems. Research on the CUPIT has supported that the CUPIT is both a reliable and valid measure of problematic marijuana use in adolescent and adult samples (Bashford, Flett, & Copeland, 2010). The CUPIT subscales show significant correlations with total counts of Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) symptoms of marijuana use disorders (abuse and dependence), as well as a number of other marijuana dependence questionnaires. The CUPIT items have shown significant ability to discriminate diagnostic subgroups along a continuum of severity, with qualitative ratings of "non-problematic," "risky," and "problematic use" (Bashford, Flett, & Copeland). CUPIT items were modified so that "cannabis" was changed to "marijuana" for all questions. These questions were modified so that they assessed the past 3 months rather than the past 12-months, so that the measure could be administered at the baseline assessment and the 3-month follow-up. Cronbach's alpha for the CUPIT total score ranged from .86 to .88 across time points.

Demographics Questionnaire. Participants were asked during the baseline assessment to provide some basic demographic information (age, sex, occupation, etc.) for descriptive purposes (Appendix G).

Assessment of Marijuana, Alcohol, and Other drug use. Marijuana use was assessed by self-reported days of use in the preceding 30 days (Appendix H). Participants were asked about their frequency of marijuana use as well as the quantity they had used during the

assessment period. Use of other substances (including alcohol and drugs other than marijuana) was also assessed by self-report. Additionally, participants reported on how much they believe other students are using different substances. Note that assessment using a timeline follow-back procedure (TLFB), though desirable, was impractical given the computerized testing. Additionally, researchers have noted that a single global question for frequency of substance use correlates very highly with the more detailed TLFB assessment (Harris et al., 2009).

Family History of drug problems. To replicate findings published by Lee, Neighbors, Kilmer, and Larimer (2010) in which family history moderated the impact of a brief online personalized feedback, family history of drug use was assessed using a modified scale from the Brief Drinker Profile (BDP; Miller & Marlatt, 1984). This modified subscale has shown good construct validity when compared to other self-report family history measures (Larimer et al., 2001; Turner, Larimer, & Sarason, 2000). Participants indicated whether any biological family members have ever had a drug problem that did or should have led to treatment (Appendix I). Following the coding system used by Lee et al., family history was coded as 0 (no history of problems) or 1 (one or more biological family member with history of problems).

Treatment Utilization Questionnaire (TUQ; Miller & Del Boca, 1994). Treatment utilization was assessed by utilizing questions adapted from the Form 90I. These questions assessed recent inpatient, outpatient, and 12-step group treatment experiences related to alcohol, other drugs, and emotional or psychological problems (Appendix J). The participant reported the number of days of treatment in each of several treatment categories. These data were collected at each assessment point to capture within study period change efforts and to document participant contact with outside treatment sources.

Marijuana Problems Index (MPI). Marijuana problems were assessed using the Marijuana Problem Inventory (MPI; Appendix K), a 23-item self-report questionnaire adapted from the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). The cannabis adaptation of the RAPI has been validated in other research (Johnson & White, 1995; Simons, Correia, Carey, & Borsari, 1998). Questionnaire items assessed the extent to which individuals experienced problem behaviors associated with cannabis use over the past 60 days. Examples of items include, "Not able to do your homework or study for a test," "Missed out on other things because you spent too much money on marijuana," and "Went to work or school high." Items were rated on a 5-point scale (0 = never, 4 = more than 10 times), and total scores were calculated by adding the item scores. Higher scores reflected greater problems associated with cannabis use. These data were collected at each assessment point. Cronbach's alpha for the MPI ranged from .76 to .89 across time points.

DSM-IV Abuse and Dependence Symptoms. Symptoms of marijuana abuse and dependence based on DSM-IV classification were assessed by converting each criterion into a Yes or No question to assess the presence of the symptom. Participants were scored as having met a criterion if they positively endorsed any question assessing that criterion. The total numbers of abuse and dependence criteria met were computed separately. Though this method of assessment is not as comprehensive as a clinical interview to assess symptoms, similar questions have been used in other well-validated, reliable assessment tools (e.g., the Global Appraisal of Individual Needs-I; Dennis, Titus, White, Unsicker, & Hodgkins, 2003; Dennis, 1999).

Marijuana Motives Measure (MMM; Simons et al., 1998). The MMM was used to assess motives for using marijuana at baseline (Appendix M). This 25-item questionnaire is composed of five subscales of motives for use, including enhancement ("I use marijuana because

it's fun"), coping ("I use marijuana because it helps me when I am depressed or anxious"), conformity ("I use marijuana because my friends pressure me to use marijuana"), social ("I use marijuana because it makes social gatherings more fun"), and expansion ("I use marijuana so I can expand my awareness"). Items are rated on a 5-point scale (1 = never or almost never, 5 = always or almost always) and the subscale total scores are calculated by taking the mean of the item responses within each subscale. Higher subscales scores are reflective of using marijuana more often for a specific motive. Cronbach's alpha for the MMM ranged from .67 to .93 across subscales. Participant responses to these questions were included as part of the Personalized Feedback report to draw the participant's attention to their primary motives for using marijuana.

Self-Efficacy Scale (SES; Stephens, Roffman, Simpson, & Whitaker, 1988). The SES is a 20-item scale which will assess self-efficacy for avoiding marijuana use (Appendix N). The SES is composed of three subscales which assess efficacy for avoiding marijuana use in situations involving negative affect, social discomfort, and the presence of others who are using marijuana. Improving self-efficacy is one goal of motivational interviewing and is a hypothesized mediating process. The scales have been found to be sensitive to changes in efficacy as a function of treatment (Stephens et al., 1993; 1995). The SES was administered at each assessment point. Cronbach's alpha for the SES ranged from .95 to .97 across time points.

Life Goals. The Life Goals assessment, based on the research of Emmons (1986), is a brief assessment developed to identify the participants' life goals for the future (Appendix O). Participants identify their top goals and then rate how their marijuana use impacts these goals currently and how reducing or quitting marijuana would impact these goals. A shortened version of this measure was used, where participants identified their top five goals rather than their top

ten. The content of participant responses to the Life Goals assessment was included in the Personalized Feedback Report.

Marijuana Goals Questionnaire (MGQ; Lozano et al., 2006). The MGQ assesses goals of abstinence versus moderate marijuana use (Appendix P). The MGQ was used to capture the participant's current use goals. This measure was included to assess the participant's specific marijuana use goal (i.e., whether the participant was interested in making a change to their marijuana use in the future) and how they feel about that goal.

Manipulation Check. After viewing feedback, participants completed a manipulation check to assess participants' perceptions of the reports they viewed (Appendix Q). This measure included general process questions about completing the online assessment and viewing the report, as well as general reactions to the reports (such as whether the report was satisfying, helpful, accurate, and interesting). Other questions assessed the specific effects of the reports. To assess areas which the PF report should impact, participants reported to what degree the report caused them to re-think their marijuana use, if they learned normative information about their use, whether the reported described their own marijuana-related problems, and whether the report prompted them to want to change their use. To assess areas which the EC report should impact, questions assessed whether participants feel that they learned about what marijuana is, marijuana's health effects, the addictive potential of marijuana, and legal and medical issues around marijuana.

Results

Preliminary Analyses

At the baseline assessment, the average participant had used marijuana on 18 of the past 30 days, reported an average of 1.71 of the seven DSM-IV dependence symptoms, and reported

an average of 0.73 of the four DSM-IV abuse symptoms. Participants reported using alcohol on eight of the past 30 days, drinking an average of 5.82 drinks per typical drinking day. Participants reported using other drugs less than 2 days of the past 30 days. No significant differences were detected between conditions in demographic variables, baseline substance use, or stage of change, suggesting that the randomization scheme was effective (See Table 2).

Of the 82 enrolled participants, 42.7% (n = 35) completed the 1-month follow-up and 29.3% (n =24) completed the 3-month follow-ups. There was no evidence of differences in attrition rate across treatment conditions at either follow-up point. Those lost to follow-up did not differ significantly on most baseline variables. When comparing those who completed the 1-month follow-up versus those who did not, there were no significant differences between follow-up attriters and follow-up completers on primary variables of interest. When comparing those who completed the 3-month follow-up versus those who did not, there was one significant effect. Three-month follow-up completers on average (M = 20.63) reported more days of marijuana use in the past 30 days when compared to non-completers (M = 16.10), F (1, 80) = 4.89, p = .03.

Manipulation Check

Sixty-seven of the 82 enrolled participants completed the manipulation check that was administered after the baseline assessment and report viewing. Though it is not possible to verify why 15 participants did not complete this questionnaire, it is likely that those 15 participants closed their web browser after reading their report and therefore were not directed to the post-baseline questionnaire page. Participant responses to the post-baseline questionnaire were analyzed to examine whether there was a differential pattern of responses to the questions based on condition assignment (See Table 3 for means and standard deviations). It was expected that response patterns would not differ across conditions for more general questions regarding the

study. There were no differences between conditions in levels of agreement on statements regarding level of satisfaction with the report (M = 3.53), helpfulness of the completing the questionnaires (M = 3.61), feeling that the questions took too much time (M = 2.84), feeling the report was interesting (M = 3.74), reading the report in detail (M = 3.91), whether the report was balanced (M = 3.45), wanting a different type of information than what was provided (M = 2.79), and helpfulness of getting the report (M = 3.48). There was a difference between conditions in level of agreement with a statement that the information in the report was not accurate, $F(1, 65) = 4.80$, $p = .03$. Participants in the PF condition were largely neutral on that statement (M = 3.05), suggesting they neither agreed nor disagreed. The average rating of agreement for participants in the EC condition was 2.47 (which falls between a rating of 2 for "disagree" and 3 for "neutral"), indicating that these participants tended to feel the information in the report was accurate.

It was expected that response patterns to other questions would differentiate the two groups, including questions on the content of the report as well as questions assessing the impact of the report. For several statements consistent with the content of the education report, there were significant differences by condition, with participants in the EC condition providing higher ratings that the report described what marijuana is, $F(1, 62) = 8.28$, $p = .005$, marijuana's impact on health, $F(1, 64) = 10.55$, $p = .002$, whether marijuana is addictive, $F(1, 62) = 20.81$, $p < .001$, medical issues related to marijuana, $F(1, 63) = 30.28$, $p < .001$, and legal issues related to marijuana, $F(1, 60) = 23.73$, $p < .001$. However, for other statements intended to capture the impact of the PF content, there was a trend for participants in the PF condition to endorse a higher level of agreement with these statements compared to participants in the EC condition, but the differences were not significant. There were no differences in ratings for statements that

the report gave them a new way of looking at their use, $F(1, 65) = 0.89$, $p = .35$, that the report caused them to rethink their use, $F(1, 65) = 0.12$, $p = .73$, that the report showed how their use relates to others, $F(1, 64) = .55$, $p = .46$, that the report described their own personal problems related to marijuana use, $F(1, 63) = 2.20$, $p = .14$, and feeling that they wanted to cut down on their use after viewing the report, $F(1, 64) = .41$, $p = .35$.

Outcome Analyses: Condition by Time

The primary outcome variable was problems associated with marijuana use, as assessed by the MPI. A 2 (Condition: PF vs. EC) X 3 (Time: Baseline, One-Month Follow-up, Three-Month Follow-up) general linear model (GLM) was conducted to determine if the active PF condition demonstrated greater reductions in marijuana problems from baseline to follow-up compared to the comparison EC condition. Given the low follow-up rates, particularly at the 3-month assessment, the GLM was also conducted with two levels of time (Baseline and One-Month Follow-up) to examine more immediate post-baseline change. A significant time X condition interaction was predicted such that problems associated with marijuana use were expected to decrease significantly more in the PF group as compared to the EC group. See Table 4 for means and standard deviations of primary variables of interest for all study participants. See Table 5 for means and standard deviations of primary of variables of interest only for participants who completed all follow-up assessments.

In the full model examining change in the MPI across all three time points (i.e., baseline, one-month, and three-month assessments), no effects were significant. When the analysis was restricted to change between baseline and one-month, there was a significant main effect of time, $F(1, 32) = 7.06$, $p = .01$, eta-squared = .18, in the predicted direction such that MPI scores

declined. However, there was no significant main effect of condition, $F(1, 32) = .18$, $p = .67$ and the condition by time interaction was also not significant, $F(1, 32) = .09$, $p = .76$.

These same models were run on secondary outcome variables, which included self-reported days of marijuana use, the CUPIT score, and the number of reported DSM-IV dependence criteria. The same pattern of results (i.e., greater reductions in the PF group compared to the EC group over time) was expected in the secondary outcome variables of marijuana use frequency, DSM-IV criteria, and the CUPIT score (see Table 4). Using all three assessment time points for days of marijuana use, there was again a significant main effect of time, $F(2, 30) = 10.70$, $p < .01$, eta-squared = .42, but the main effect for condition, $F(2, 30) = 1.50$, $p = .24$, and the interaction effect, $F(2, 30) = 1.57$, $p = .23$, were not significant. When analyses were then conducted for two time points (baseline and one-month) for days of marijuana use, there was a main effect of time, $F(1, 33) = 10.30$, $p = .003$, eta-squared = .24, and condition, $F(1, 33) = 6.13$, $p = .02$, eta-squared = .16, such that days of use decreased over time and use rates were lower in the PF group ($M = 13.22$) compared to the EC group ($M = 18.88$). However, the condition by time interaction was not significant $F(1, 33) = .61$, $p = .44$.

Because the CUPIT was only collected at baseline and three-months, analyses for the CUPIT necessarily included only those two time points. Neither the main effects nor the interaction effect were significant. For the total number of DSM-IV dependence symptoms, across all three time points, there were no significant main or interaction effects, but the interaction effect did approach significance, $F(2, 28) = 2.78$, $p = .08$, such that the number of symptoms slightly increased over time in the EC group and decreased over time in the PF group. For dependence symptoms from baseline to one-month follow-up, there was a main effect of time, $F(1, 32) = 5.34$, $p = .03$, eta-squared = .14, such that the number of symptoms decreased

over time from baseline to one-month follow-up. The main effect for condition, $F(1, 32) = .50$, $p = .48$, and the interaction effect, $F(1, 32) = 2.14$, $p = .15$, were not significant.

Because this was the primary outcome analysis, effect sizes were examined more closely by calculating Cohen's *d* for each outcome variable (Cohen, 1988). Univariate analyses of variance were conducted for outcome variables, with condition entered as the between subjects factor and the baseline value entered as a covariate in the analysis to control for baseline levels on each variable. Cohen's *d* was calculated based on the adjusted marginal means yielded by these analyses, using the formula $d = (x_1 - x_2)/(\text{pooled SD})$. Based on the standards defined by Cohen (1988), effect sizes from 0.2 to 0.3 are considered small, effect sizes from 0.4 to 0.7 are medium, and those above 0.8 are large. Cohen's *d* was below the range for small effect for MPI scores (*d* = 0.17 at one-month, 0.08 at three-months) and the CUPIT scores (*d* = 0.16 at three-months). For days of marijuana use, Cohen's *d* was 0.56 at one-month and 0.45 at three-months, indicating a medium effect size. For total symptoms of marijuana dependence, Cohen's *d* was 0.59 at one-month and 0.82 at three-months, indicating a medium to large effect size.

Outcome Analyses: Condition and Stage of Change by Time

A 2 (Condition: PF vs. EC) X 3 (Stage of Change: Precontemplators vs. Contemplators vs. Preparation/Action/Maintenance) X 3 (Time: Baseline, One-Month Follow-up, Three-Month Follow-up) GLM was conducted to examine whether there was differential change in marijuana problems across time based on Stage of Change and Condition assignment (See Table 6 for descriptive values). A three-way interaction of Condition X Stage of Change X Time was expected such that participants in the earlier stages of change (Precontemplation, Contemplation) in the PF condition would show a greater reduction in marijuana problems compared to the EC condition, whereas those in the later stages of change (Preparation/Action/Maintenance) might

do equally well across treatment conditions, because their already high motivation to change may not be additionally enhanced by the personalized feedback report. Across all time points, there were no significant main or interaction effects for the MPI. From baseline to one-month follow-up, there was a main effect of time, $F(1, 28) = 4.92$, $p = .04$, eta-squared = .15, such that MPI scores decreased over time. However, there were no other significant main effects and no significant interaction effects.

The same model was used to examine other outcome variables. Across all time points, for days of marijuana use, there was a main effect of time, $F(2, 24) = 6.44$, $p = .006$, eta-squared = .35, but there were no other significant main effects or interaction effects. For days of marijuana use from baseline to one-month, there was a significant main effect of time, $F(1, 29) = 8.68$, $p = .006$, eta-squared = .23, condition, $F(1, 29) = 9.60$, $p = .004$, eta-squared = .25, and stage of change, $F(2, 29) = 4.49$, $p = .02$, eta-squared = .24. The mean number of days was higher in the EC group ($M = 19.76$) as compared to the PF group ($M = 13.02$). The number of days was lower for participants in the later stages of change ($M = 11.96$) compared to those in the precontemplation ($M = 18.33$) or the contemplation ($M = 18.88$) stages. There were no significant interaction effects.

For CUPIT scores from baseline to three-month, there were no significant main or interaction effects. For the total number of DSM-IV dependence symptoms, from baseline to three-month, a significant condition by time effect, $F(2, 22) = 12.76$, $p < .001$, eta-squared = .54, was qualified by a significant interaction effect of condition X stage of change X time, $F(2,22) = 9.33$, $p = .001$, eta-squared = .46. In general, participants in the PF condition who were in earlier stages of change experienced a slight decrease in dependence symptoms (about .5 decrease in mean values), whereas those in the later stages of change decreased their number of symptoms

by two. Among those in the EC condition, there was no change in number of symptoms amongst those in the earlier stages of changes, and there was a substantial increase for those in the later stages of change (increased by 5). From baseline to one-month follow-up, there was a main effect of time, $F(1, 28) = 4.41$, $p = .05$, eta-squared = .14, such that the number of symptoms decreased over time from baseline to one-month follow-up. There were no other significant main or interaction effects.

Outcome Analyses: Condition by Family History by Time

Finally, the moderating effect of family history of drug use was examined by including family history as a between subjects factor (as either positive or negative for family history) with condition in a repeated measures analysis. A 2 (Condition: PF vs. EC) X 2 (Family History: Positive vs. Negative) X 3 (Time: Baseline, One-Month Follow-up, Three-Month Follow-up) GLM was performed to accomplish this examination (See Table 7 for descriptive values). It was expected that the participants in the PF condition who reported a family history of drug problems would show greater reductions in marijuana problems over time than those participants in the PF condition who did not report a family history of drug problems (Lee, Neighbors, Kilmer, & Larimer, 2010). Again, given the small sample size at follow-ups, GLMs were also conducted with two levels of time (Baseline and One-Month Follow-up) to assess more short-term changes.

In MPI scores across all three time points, there were no significant main or interaction effects. There was a main effect of time showing a decrease in MPI scores from baseline to one-month, $F(1, 30) = 6.90$, $p = .003$, eta-squared = .19, but no other main or interaction effects were significant.

Across all time points, for days of marijuana use, there was a main effect of time, $F(2, 26) = 10.74$, $p < .001$, eta-squared = .45, but no other significant main or interaction effects. For

days of marijuana use from baseline to one-month, there was a main effect of time, $F(1, 31) = 10.48$, $p = .003$, eta-squared = .25, and condition, $F(1, 31) = 6.21$, $p = .02$, eta-squared = .17, but no significant interaction effects. The interaction effect for family history status by time did approach significance, $F(1, 31) = 3.70$, $p = .06$, eta-squared = .11. Participants who were family history positive decreased days of marijuana use from 18.72 to 11.22, while those were family history negative decreased only 18.19 to 16.29 days in the past month.

There were no significant main or interaction effects when examining change in CUPIT scores by condition and family history status from baseline to three-month. For symptoms of marijuana dependence, there were no significant main or interaction effects across all time points. There was a significant effect of time for dependence symptoms from baseline to one-month, $F(1, 30) = 5.46$, $p = .03$, eta-squared = .15, with symptoms decreasing over time, but there were no other significant main or interaction effects.

Analyses on Alcohol and Other Substance Use

Finally, though there were no a priori hypotheses regarding other substance use and it was not specifically a target for change, the same GLM models described above were conducted on alcohol and other drug use variables to examine potential changes in those use patterns. There were no changes in reported days of alcohol or other drug use by condition from baseline to follow-up.

Discussion

The present study examined the impact of a very brief, online personalized feedback report for problematic marijuana users. Given the high levels of utilization of web-based health information by the majority of Americans, as well as research indicating that web-based interventions can help overcome multiple barriers to treatment-seeking amongst problematic

substance users, development of empirically-validated, effective online interventions for substance abuse is an important area of research. This study extends the current literature by including a comparison group to control for amount of content, specifically targeting marijuana users who reported problematic use, and utilizing a follow-up period lasting several months (rather than one month only). This project was generally successful in reaching the targeted population and attracting a large number of voluntary marijuana users to complete the screening measure. However, findings were not consistent with the hypothesized effects of the brief personalized feedback intervention.

Overall, there was a lack of evidence for differential change as a function of condition, stage of change, or family history of problematic substance use. The primary hypothesis that marijuana users who received personalized feedback on their use would report better outcomes than users who received only education about marijuana was not supported. Marijuana-related problems, frequency of marijuana use, and marijuana dependence symptoms all decreased from baseline to the one-month follow-up, but these changes were not different based on condition assignment. These modest reductions across the first follow-up assessment were not sustained at the three-month follow-up assessment for marijuana-related problems, but they were sustained for frequency of marijuana use. Additional hypotheses that stage of change and family history of substance use would moderate the effect of condition were also generally not supported.

Currently, the effect of time that occurs across several dependent variables is difficult to interpret in the absence of significant interaction effects. There are several possible explanations for such change over time. First, the reductions observed in this data may simply be the result of regression to the mean. Second, the changes may be the result of an assessment effect after completing the baseline battery (where participants had to respond to a multitude of questions

about how their use might have been problematic for them). Answering such questions may in and of itself be an agent of change. Finally, it is possible that the reductions seen in this study are the result of the intervention employed in this study.

The lack of support for differential change in marijuana-related problems and marijuana use frequency based on condition assignment is consistent with the results reported in the study by Lee and colleagues (2010). In the Lee et al. study, however, the researchers did find support for family history of substance abuse and (to a lesser degree) stage of change as moderating factors. Given the limited sample size, many analyses were likely not adequately powered to detect statistically significant differences between conditions. Several interaction effects approached significance, and one significant three-way interaction was detected when examining changes over time in the number of marijuana dependence symptoms based on condition assignment and stage of change. In that analysis, participants in the personalized feedback condition reported reduced symptoms over time, with participants in the later stages of change reporting the largest reduction in symptoms. By contrast, dependence symptoms did not decline over time for participants in the education control condition. While symptoms did not change for EC participants in the earlier stages of change, symptoms actually increased substantially for participants in the later stages of change. The absence of significant interaction effects and the small size of the sample completing the three month follow-up prohibit concluding that there was evidence of an effect of the PF intervention, but further research in an adequately powered sample appears justified.

The sample size available for analyses was impacted by two primary factors: low rate of study enrollment and high study attrition rates at follow-up. Study recruitment was generally effective, with many participants completing the screening questionnaire and subsequently being

eligible for the study. For unknown reasons, nearly half of eligible participants did not choose to enroll in the study. Analysis of screening data did not help clarify why so many eligible participants did not choose to enroll. There are several possible reasons for nonparticipation. First, it is possible that those who chose not to participate simply were not interested in or motivated for change. For these individuals, it is possible they participated in the screening portion of the study with no intention of enrolling beyond that point. While there were not significant differences between those who enrolled and those who did not on screening variables, people who did enroll reported on average more days of marijuana use and had slightly higher scores on the CUPIT compared to those who did not enroll. It is possible that these modest differences in participant characteristics did impact interest in participating in the study, such that those with fewer problems and lower rates of use did not feel participation in the study would particularly benefit them. It is also possible that some participants completed the screening assessment primarily to earn extra credit in psychology courses. As such, their interest in participating further may not have extended beyond the portion of the study involving course extra credit as compensation. Finally, the post-screening invitation to enroll in the study and complete the baseline was sent after a 24-hour delay, as an attempt to reduce later attrition. It may be that this delay had an unintended effect of dissuading some otherwise willing participants from continuing in the study.

In addition, the attrition of participants across follow-up was higher than expected. There were very few detectable differences between attriters and non-attriters. It is possible that other factors related to the study design impacted continued participation by enrolled participants. First, incentives for participation were limited to a lottery with a 5% chance of winning a $20 gift certificate. This modest incentive may not have been adequate to motivate some participants to

enroll after screening or continue participation after completing the baseline process. Second, participants were contacted exclusively via e-mail, as other contact information was not collected in an attempt to require as little identifying data from participants as possible, to maximize participants' comfort in disclosing substance use. E-mail prompts for follow-up participation were automatically generated by computer algorithms using a standardized text. Some participants may not have been diligent about checking their e-mail accounts, and it may be that the form e-mails were not personalized enough to engage participants to complete the follow-up. More personalized communications to encourage follow-up participation, or prompting via other forms of contact, may have reduced the attrition of this study.

Based on the post-baseline questionnaire, participants appeared to experience the assessment process and report-viewing process positively, and did not feel the assessment procedures were overly burdensome. Evidence was mixed that participants in the PF and EC conditions experienced different interventions as intended. On all five questions assessing the content of the EC report, there was generally clear differentiation between conditions, such that the EC participants endorsed exposure to that content and PF participants did not endorse exposure to the content. However, for the six questions meant to assess the impact of the personalized feedback report (e.g., feeling that the report gave them a new way of looking at their use), there was not a differential pattern of responses based on condition. This lack of significant effects on these questions is a concern, and there are multiple possible explanations for why there was no differentiation by condition. First, participants in the PF condition may not have read their report closely and therefore the report may not have had the intended impact. Second, the lack of differentiation may also be related to the validity of the assessment questions used in the manipulation check itself. It is possible that the questions, while face valid, were not

able to detect the impact of the personalized content. Third, while the education control report was designed to be neutral and not elicit change, it is possible that reading information on health effects, addictive potential, legal issues, and other topics related to marijuana may actually been impactful for some participants, causing them to endorse these items.

Research has indicated that the amount of time spent reviewing the feedback report (consequently learning and retaining the information the report contains) likely effects what impact the report has. Jouriles et al. (2010) conducted a study in which heavy-drinking college students received a computerized personalized feedback report and then either went home, spent 20 minutes reviewing the report, or spent 20 minutes writing down everything they could remember about their report. Participants who were asked to complete additional rehearsal of the report's content (either by re-reading it or writing out the details of the report) reported lower rates of alcohol use at two-week follow-up compared to those in the standard condition who were simply sent home after viewing their report. In the present study, participants were not required to view the report for any specified amount of time, and therefore it is possible that some participants did not spend adequate time reviewing the content of the report.

This study was designed to evaluate the impact of a very brief, web-based personalized feedback intervention on college students who reported problematic marijuana use. While several brief online interventions have been developed for alcohol and cigarette use, there is a need for empirically-supported online interventions for marijuana users. This study had several strengths, including use of a comparison group to control for exposure to content, inclusion of a three-month follow-up period, and recruitment of participants who were actively experiencing problems related to their marijuana use. Analyses in general did not support the hypothesis that the personalized feedback would lead to greater reductions in marijuana-related problems and

marijuana use frequency when compared to a control group. There were several limitations to the study which likely led to the overall lack of statistical support for proposed hypotheses. Most notably, the overall enrolled sample size was low and there was an unexpectedly high rate of attrition. Additionally, it is not clear that the personalized feedback report had the intended impact on participants, either because participants were not adequately attending to the report or because the report was not as effective as predicted. Despite these limitations, several trends in the data are promising. Effect sizes across several outcome variables, including frequency of use and symptoms of dependence, were in the medium range, despite the low sample size. Reductions in both problems associated with marijuana use and with frequency of use were evident across the first follow-up period. Future research in adequately powered studies that address the limitations of the present study is justified.

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Table 1

Means and standard deviations for screening variables amongst enrolled participants versus those who chose not to enroll

	Enrolled N = 82		Not Enrolled N = 80		Total N = 162	
Variable	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Screening MJ Use (Days in Past 30 Days)	18.45	7.67	16.06	8.31	17.27	8.06
Age	19.77	1.25	19.64	1.38	19.70	1.31
CUPIT Total Score	28.22	9.71	25.45	12.04	26.85	10.98

Table 2

Means and standard deviations for participant characteristics across conditions

	PF N = 41		EC N = 41		Total Available	
Variable	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Screening MJ Use (Days in Past 30 Days)	17.51	7.19	19.39	8.11	18.45	7.67
Age	19.71	1.35	19.83	1.16	19.77	1.25
Age of First MJ Use	16.24	1.71	16.15	2.02	16.20	1.86
Baseline MJ Use (Days in Past 30 Days)	16.51	8.71	18.34	8.55	17.43	8.62
Baseline DSM-IV Total Criteria for Marijuana Dependence	1.76	1.65	1.66	1.89	1.71	1.77
Baseline DSM-IV Total Criteria for Marijuana Abuse	0.76	0.83	0.71	0.72	0.73	0.77
CUPIT Total Score	27.41	8.83	29.02	10.56	28.22	9.71
MPI Total Score	9.02	7.04	8.71	8.46	8.87	7.73
Baseline Alcohol Use (Days in Past 30)	8.15	5.48	8.10	4.71	8.12	5.08
Baseline Other Drug Use (Days in Past 30)	1.85	5.47	2.00	4.93	1.93	5.17

Table 3

Means and standard deviations for post-baseline questionnaire

Question	PF N = 37		EC N = 30		Total N = 67	
	M	*SD*	*M*	*SD*	*M*	*SD*
1. I am satisfied with the report I just received	3.54 [a]	.92	3.52 [a]	.91	3.53	.91
2. Filling out the questionnaires was helpful	3.64 [a]	.83	3.57 [a]	.73	3.61	.78
3. Filling out the online questionnaires took too much time	2.68 [a]	.97	3.03 [a]	.93	2.84	.96
4. The feedback gave me a new way of looking at my marijuana use	3.24 [a]	.96	3.47 [a]	.97	3.34	.96
5. The report I received was interesting	3.83 [a]	.66	3.63 [a]	.89	3.74	.77
6. I don't think that the information I received was accurate	3.05 [a]	1.08	2.47 [b]	1.11	2.79	1.12
7. I read my report in detail	3.95 [a]	.85	3.87 [a]	1.04	3.91	.93
8. The report was very balanced and neutral	3.32 [a]	1.13	3.60 [a]	.86	3.45	1.02
9. I wanted a type of information not offered by this project	2.65 [a]	1.04	2.96 [a]	1.06	2.79	1.05
10. Getting the report was helpful	3.51 [a]	.70	3.43 [a]	.86	3.48	.77
11. I learned about what marijuana is and how it is used	2.20 [a]	.96	2.93 [b]	1.07	2.53	1.07
12. The report I received led me to re-think my own marijuana use	2.84 [a]	1.14	2.93 [a]	1.11	2.88	1.12
13. I learned from my report how marijuana affects several different aspects of physical health	2.64 [a]	1.02	3.40 [b]	.86	2.98	1.02
14. I learned about how my use relates to other peoples use	3.30 [a]	1.15	3.10 [a]	.90	3.21	1.05
15. The report described whether marijuana can be addictive	2.68 [a]	1.07	3.70 [b]	.65	3.16	1.03
16. The report described aspects of my own problems related to marijuana use	3.38 [a]	.92	3.04 [a]	.92	3.23	.93
17. I got information about medical issues related to marijuana use	2.63 [a]	1.00	3.77 [b]	.57	3.15	1.00
18. After viewing the report, I feel that I want to cut down on my marijuana use	2.92 [a]	1.20	2.73 [a]	1.11	2.83	1.16
19. The report gave me information about legal issues related to marijuana use	2.36 [a]	.93	3.48 [b]	.87	2.89	1.06
20. The information in the report makes me wonder whether I should get treatment for my marijuana use	1.68 [a]	.85	2.07 [a]	1.12	1.85	.99

Note. Sample size varies slightly per item.

[a b] Values within an item that do not share a superscript differ significantly at $p < .05$.

Table 4

Means and standard deviations for participant characteristics across conditions over time

	Baseline		One-Month Follow-up		Three-Month Follow-up	
	PF *n* = 41	EC *n* = 41	PF *n* = 18	EC *n* = 17	PF *n* = 12	EC *n* = 12
MPI Score	9.02 (7.04)	8.71 (8.46)	5.11 (5.68)	6.06 (4.33)	4.36 (2.80)	8.83 (11.12)
CUPIT Score	27.41 (8.83	29.02 (10.56)	--	--	22.45 (7.47)	27.92 (14.56)
Days of Marijuana use in the past 30 days	16.51 (8.71)	18.34 (8.55)	10.22 (8.25)	17.06 (9.24)	12.08 (8.94)	16.50 (10.65)
DSM-IV Total Criteria for Marijuana Dependence	1.76 (1.65)	1.66 (1.89)	0.67 (1.03)	1.25 (1.29)	0.45 (0.82)	2.25 (2.63)
DSM-IV Total Criteria for Marijuana Abuse	0.76 (0.83)	0.71 (0.72)	0.22 (0.55)	0.63 (0.62)	0.45 (0.52)	0.92 (1.00)
Days of Alcohol use in the past 30 days	8.15 (5.48)	8.10 (4.71)	8.11 (6.15)	6.44 (4.47)	7.42 (6.96)	5.33 (4.54)
Days of Other drug use in the past 30 days	1.85 (5.47)	2.00 (4.93)	1.50 (3.43)	1.94 (3.42)	0.33 (0.65)	1.67 (2.84)

Table 5

Means and standard deviations for participant characteristics across conditions over time, for follow-up completers only

	Baseline		One-Month Follow-up		Three-Month Follow-up	
	PF *n* = 12	EC *n* = 12	PF *n* = 12	EC *n* = 12	PF *n* = 12	EC *n* = 12
MPI Score	5.33 (4.46)	10.92 (13.03)	4.22 (3.70)	5.50 (3.42)	4.36 (2.80)	8.83 (11.12)
CUPIT Score	25.25 (9.85)	30.00 (9.81)	--	--	22.45 (7.47)	27.92 (14.56)
Days of Marijuana use in the past 30 days	20.17 (7.66)	21.08 (7.85)	9.89 (8.19)	16.00 (8.96)	12.08 (8.94)	16.50 (10.65)
DSM-IV Total Criteria for Marijuana Dependence	1.00 (1.13)	1.92 (2.58)	0.67 (1.12)	1.75 (1.28)	0.45 (0.82)	2.25 (2.63)
DSM-IV Total Criteria for Marijuana Abuse	0.67 (0.78)	0.83 (0.72)	0.11 (0.33)	0.88 (0.64)	0.45 (0.52)	0.92 (1.00)
Days of Alcohol use in the past 30 days	9.58 (5.85)	6.58 (5.20)	7.33 (5.10)	5.75 (5.09)	7.42 (6.96)	5.33 (4.54)
Days of Other drug use in the past 30 days	1.00 (3.46)	1.83 (3.38)	2.67 (4.64)	2.13 (3.64)	0.33 (0.65)	1.67 (2.84)

Table 6

Participant characteristics by condition and Stage of Change over time

	Precontemplation			Contemplation			Preparation/Action/ Maintenance		
	Baseline	One-Month	Three-Month	Baseline	One-Month	Three-Month	Baseline	One-Month	Three-Month
MPI Score									
PF	6.50	4.25	4.50	3.67	4.00	4.67	8.00	4.00	6.00
	(5.26)	(4.72)	(2.08)	(6.34)	(4.58)	(2.31)	(--)	(--)	(--)
EC	7.29	5.14	5.00	--	--	--	7.00	8.00	11.00
	(6.70)	(5.53)	(6.63)				(--)	(--)	(--)
Days of Marijuana use in the past 30 days									
PF	24.00	16.25	19.50	17.25	5.75	5.75	15.00	1.00	3.00
	(2.71)	(7.54)	(6.61)	(9.91)	(4.35)	(4.92)	(--)	(--)	(--)
EC	21.57	16.43	16.57	--	--	--	16.00	13.00	25.00
	(7.35)	(9.59)	(9.32)				(--)	(--)	(--)
CUPIT Score									
PF	25.00	--	21.83	19.67	--	22.33	33.00	--	24.50
	(9.51)		(8.01)	(11.55)		(6.43)	(11.31)		(12.02)
EC	26.13	--	23.88	--	--	--	37.75	--	36.00
	(6.08)		(8.34)				(12.09)		(22.00)
DSM-IV Total Criteria for Marijuana Dependence									
PF	1.50	1.25	1.00	1.00	0.33	0.33	2.00	0.00	0.00
	(1.00)	(1.50)	(1.15)	(1.73)	(0.58)	(0.58)	(--)	(--)	(--)
EC	1.29	1.57	1.29	--	--	--	0.00	3.00	5.00
	(1.11)	(1.27)	(1.60)				(--)	(--)	(--)

Table 7

Participant characteristics by condition and family history of substance abuse over time

	Family History Positive			Family History Negative		
	Baseline	One-Month	Three-Month	Baseline	One-Month	Three-Month
MPI Score						
PF	4.67	5.00	4.33	6.20	3.60	5.00
	(5.69)	(3.46)	(2.08)	(5.36)	(4.51)	(2.00)
EC	10.25	6.75	8.00	4.25	4.25	3.50
	(7.68)	(4.03)	(7.70)	(2.63)	(2.63)	(5.07)
Days of Marijuana use in the past 30 days						
PF	23.33	10.33	10.33	18.33	9.67	12.17
	(7.64)	(10.50)	(8.50)	(7.34)	(7.94)	(10.13)
EC	20.25	14.00	15.50	21.50	18.00	19.75
	(7.63)	(7.62)	(10.08)	(7.59)	(10.89)	(9.00)
CUPIT Score						
PF	27.20		25.00	23.17		20.33
	(11.76)	--	(7.84)	(9.62)	--	(7.12)
EC	30.14		26.86	29.80		29.40
	(7.43)	--	(15.61)	(13.48)	--	(14.57)
DSM-IV Total Criteria for Marijuana Dependence						
PF	1.67	1.00	0.67	1.20	0.60	0.60
	(1.53)	(1.00)	(1.15)	(1.10)	(1.34)	(0.89)
EC	2.00	2.50	2.00	0.25	1.00	1.50
	(0.82)	(0.58)	(1.83)	(0.50)	(1.41)	(2.38)

Appendix A
Consent Form for Screening Assessment

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Informed Consent for Participants
in Research Projects Involving Human Subjects

Title of Project: Brief Internet-Based Feedback for Marijuana Use: Part 1
Investigator(s): Sheri Towe, M.S. and Robert S. Stephens, PhD.

I. Purpose of this Research

You are invited to participate in a research study investigating a brief internet-based feedback for marijuana use. This study is a project for college students who have questions about their marijuana use or are interested in receiving information about their marijuana use. The purpose of this study is to better understand how two different types of reports can affect your thinking about your marijuana use. We hope to find out if the reports offered in this study are useful to college students like you. Approximately 184 students currently attending Virginia Tech will be recruited to participate in this study.

The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. If you have questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear, you can contact the research staff using the contact information listed at the end of this form. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called "informed consent." You can print a copy of this form for your own records, or we can email you the form if you prefer.

II. Procedures

This study consists of two parts. In order to participate in Part 2 of the study, you must have participated in Part 1 and meet certain criteria. Participation in Part 1 of this study will involve answering some questions about your marijuana use and some things you may have experienced as a result of your marijuana use. You will complete these questions online. It is expected that these questions will take approximately 15 minutes to complete. After you complete the questions in Part 1, the web page will give you some information about continuing with Part 2 of the study. If you choose to participate in Part 2 of this study, an additional consent form will be presented to you describing that part of the study.

III. Risks

Few risks are involved with participation in this study. If there are any questions that make you feel uncomfortable, you may refuse to answer those questions or discontinue your participation in the study without penalty. It is possible that information about the use of illegal drugs or alcohol could inadvertently be linked to you through participation in this study. Every effort is being taken to prevent this from happening and is described further in Section V of this document. If you would like a referral to treatment for any problems related to information collected as part of this study, you may contact the investigator for such information. If you do wish to seek treatment services after participating in this study, the project does not have funds to pay for such services and therefore you will be responsible for the cost of any treatment you receive.

IV. Benefits

No promise or guarantee of benefits have been made to encourage you to participate. You may benefit from participating in this study by learning about your marijuana use. In addition, you may benefit by learning how psychological research is conducted. If you are interested in receiving information on the results of this study following its completion please indicate so in the box at the end of the next page and provide an e-mail address where you would like to receive this information. *Agreeing to receive this information will in no way affect the confidentiality of your responses today.*

V. Extent of Anonymity and Confidentiality

The information gathered during this experiment will be coded in a way that your name will not be revealed. The information you provide will be kept strictly confidential. Your name will not be associated with your data; rather an identification number will be used. A code key will be the only place that your identification number and your name will be associated. The data and the code key will not be stored together. Each will be stored in separate secure locations. The researchers (Sheri Towe and Dr. Robert Stephens) will be the only people that have access to this information and at no time will the researchers release the results of the study to anyone other than individuals working on the project without your written consent. Once data collection is completed and the code key is no longer needed, it will be destroyed in order to protect your confidentiality. Without the code key there is no means to link the information you have provided with your name or identity. The information will be combined by groups and analyzed. It is possible that the Institutional Review Board (IRB) may review this study's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

VI. Compensation

Students in psychology courses will be eligible to receive one research credit for participating in Part 1 of this study. It is not necessary for you to participate in research to receive research credits. All psychology courses that offer benefits for receiving research credits also offer alternate ways to obtain these credits other than participating in research. These alternate ways are described in the syllabus for each course.

If you are completing Part 1 through the project website, no compensation is offered for completing the screening assessment.

If you continue to Part 2 of the study, Part 2 of the study will involve a baseline assessment and two follow-up assessments at one-month and three-months after the baseline. For each assessment you complete, you will be entered into a lottery for a $20 gift certificate. Participants who complete all parts of the study will be entered into an additional bonus lottery for a $20 gift certificate. Chances of winning the lottery are 1 in 20. Winners will be selected by a random drawing conducted by the investigator. All drawings will be conducted with a witness present to ensure that no bias occurred during the lottery drawing. Winners of these gift certificates will be notified through email after the drawing.

VII. Freedom to Withdraw

If you wish to stop participating in the study at any time, you may do so without any penalty. You will still be entered into lotteries up to the point you withdrew. To withdraw, you may simply contact the experimenter to express that you want to withdraw, and you will not be contacted again. You may also choose not to answer specific questions without penalty.

VIII. Participant's Responsibilities

I voluntarily agree to participate in the research study. I have the following responsibilities:

I will be responsible for completing several questionnaires that ask about my use of marijuana and experiences I may have had as a result of marijuana use. I will answer the questions honestly.

IX. Participant's Permission

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

_____ _____

Participant's digital signature Date

☐ Please check here if you would like a summary of the results of this study and list the address or email where you would like them sent.

_____

_____

_____

☐ Please check here if you would like a copy of the consent form sent to you by e-mail.

Should I have any pertinent questions about this research or its conduct, and research subjects' rights, and whom to contact in the event of a research related injury, I may contact.

Sheri L. Towe, M.S. Investigator	Telephone (540) 231-7631	email: towe@vt.edu
Robert S. Stephens, PhD. Faculty Advisor	Telephone (540) 231-6304	email: stephens@vt.edu
David Harrison, PhD. Departmental Reviewer	Telephone (540) 231-4422	email: dwh@vt.edu
Dr. David Moore Chair, Virginia Tech Institutional Review Board for the Protection of Human Subjects. Office of Research Compliance 2000 Kraft Drive, Suite 2000 (0497) Blacksburg, VA 24060	telephone (540) 231-4491	email: moored@vt.edu

Appendix B
Consent Form for Study Enrollment

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Informed Consent for Participants
in Research Projects Involving Human Subjects

Title of Project: Brief Internet-Based Feedback for Marijuana Use: Part 2
Investigator(s): Sheri Towe, M.S. and Robert S. Stephens, PhD.

I. Purpose of this Research

You are invited to participate in a research study investigating a brief internet-based feedback for marijuana use. This study is a project for college students who have questions about their marijuana use or are interested in receiving information about their marijuana use. The purpose of this study is to better understand how two different types of reports can affect your thinking about your marijuana use. We hope to find out if the reports offered in this study are useful to college students like you. Approximately 184 students currently attending Virginia Tech will be recruited to participate in this study.

The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. If you have questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear, you can contact the research staff using the contact information listed at the end of this form. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called "informed consent." You can print a copy of this form for your own records, or we can email you the form if you prefer.

II. Procedures

If you decide to participate in Part 2 of this study, you will first complete an initial assessment. For this initial assessment, you will answer questions about your use of marijuana and other substances. We will also ask you about your background, things you may have experienced because of your marijuana use, attitudes you might have about future marijuana use, and your goals for the future. This initial assessment should take approximately one hour to one-and-a-half hours to complete.

The study will use two different types of reports: a personalized feedback report and an informational report. If you decide to participate in Part 2 of this study, you will be randomly assigned to receive one of those two types of reports. You will view the report on the project website. After viewing the report, we will ask you to complete one more questionnaire so that we can get your feedback on the report.

We will ask you to complete follow-up assessments at one-month and three-months after your initial assessment. These follow-up assessments will repeat some of the questions you answered during the initial assessment. Each follow-up assessment should take about 45 minutes to one hour to complete.

In summary, your total period of involvement in the project will be three months.

All components of the study will be done online at the project website.

III. Risks

Few risks are involved with participation in this study. If there are any questions that make you feel uncomfortable, you may refuse to answer those questions or discontinue your participation in the

study without penalty. It is possible that information about the use of illegal drugs or alcohol could inadvertently be linked to you through participation in this study. Every effort is being taken to prevent this from happening and is described further in Section V of this document. If you would like a referral to treatment for any problems related to information collected as part of this study, a list of different options will be presented at the end of the initial online session. You may also contact the investigator for additional information. If you do wish to seek treatment services after participating in this study, the project does not have funds to pay for such services and therefore you will be responsible for the cost of any treatment you receive.

VI. Benefits

No promise or guarantee of benefits have been made to encourage you to participate. You may benefit from participating in this study by learning about your marijuana use. In addition, you may benefit by learning how psychological research is conducted. If you are interested in receiving information on the results of this study following its completion please indicate so in the box at the end of the next page and provide an e-mail address where you would like to receive this information. *Agreeing to receive this information will in no way affect the confidentiality of your responses today.*

V. Extent of Anonymity and Confidentiality

The information gathered during this experiment will be coded in a way that your name will not be revealed. The information you provide will be kept strictly confidential. Your name will not be associated with your data; rather an identification number will be used. A code key will be the only place that your identification number and your name will be associated. The data and the code key will not be stored together. Each will be stored in separate secure locations. The researchers (Sheri Towe and Dr. Robert Stephens) will be the only people that have access to this information and at no time will the researchers release the results of the study to anyone other than individuals working on the project without your written consent. Once data collection is completed and the code key is no longer needed, it will be destroyed in order to protect your confidentiality. Without the code key there is no means to link the information you have provided with your name or identity. The information will be combined by groups and analyzed. It is possible that the Institutional Review Board (IRB) may review this study's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

VI. Compensation

Students in psychology courses will be eligible to receive one research credit for participating in Part 1 of this study. All psychology courses that offer benefits for receiving research credits also offer alternate ways to obtain these credits other than participating in research. These alternate ways are described in the syllabus for each course. If you complete Part 1 through the project website, no compensation is offered.

Part 2 of the study will involve a baseline assessment and two follow-up assessments at one-month and three-months after the baseline. For each assessment you complete, you will be entered into a lottery for a $20 gift certificate. Participants who complete all parts of the study will be entered into an additional bonus lottery for a $20 gift certificate. Chances of winning the lottery are 1 in 20. Winners will be selected by a random drawing conducted by the investigator. All drawings will be conducted with a witness present to ensure that no bias occurred during the lottery drawing. Winners of these gift certificates will be notified through email after the drawing.

VII. Freedom to Withdraw

If you wish to stop participating in the study at any time, you may do so without any penalty. You will still be entered into lotteries up to the point you withdrew. To withdraw, you may simply contact the experimenter to express that you want to withdraw, and you will not be contacted again. You may also choose not to answer specific questions without penalty.

VIII. Participant's Responsibilities

I voluntarily agree to participate in the research study. I have the following responsibilities:

I will be responsible for completing several questionnaires that ask about my use of marijuana and experiences I may have had as a result of marijuana use. I will answer the questions honestly. After I complete these questionnaires, I will review the report presented to me. Lastly, I will be responsible for completing follow-up assessments at one-month and three-months after my first assessment.

IX. Participant's Permission

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

_____ _____

Participant's digital signature Date

☐ Please check here if you would like a summary of the results of this study and list the address or email where you would like them sent.

_____

_____

_____

☐ Please check here if you would like a copy of the consent form sent to you by e-mail.

Should I have any pertinent questions about this research or its conduct, and research subjects' rights, and whom to contact in the event of a research related injury, I may contact.

Sheri L. Towe, M.S. Telephone (540) 231-7631 email: towe@vt.edu
Investigator

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Faculty Advisor

David Harrison, PhD. Telephone (540) 231-4422 email: dwh@vt.edu
Departmental Reviewer

Dr. David Moore telephone (540) 231-4491 email: moored@vt.edu
Chair, Virginia Tech Institutional Review
Board for the Protection of Human Subjects.
Office of Research Compliance
2000 Kraft Drive, Suite 2000 (0497)
Blacksburg, VA 24060

Appendix C
Sample Personalized Feedback Report

Your Feedback Report

4/28/12

MFB Study
Virginia Tech

Your Marijuana Use

You just answered a lot of different questions about your marijuana use. Let's have a look at what we learned about your use.

You told us that you used marijuana on 10 of the past 30 days.

You said you used about 1/8th of an ounce per week.

Your Beliefs About Your Fellow VT Students

How much are your fellow VT students using marijuana?

You believed that most VT students used marijuana 5 days per month

Among VT students who have ever tried marijuana, most did not use marijuana in the past 30 days.

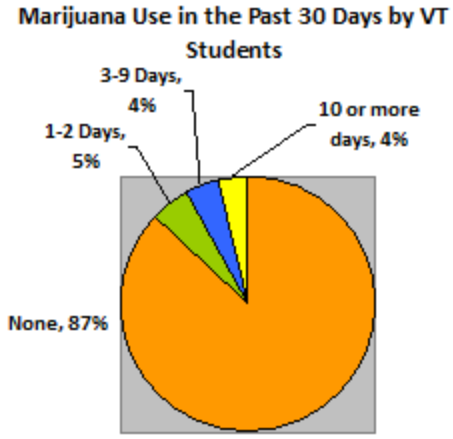
Most students think more students have tried marijuana than they actually have.

It turns out that most VT students have not ever tried marijuana - about 70% of students at VT have never tried marijuana.

How Does Your Marijuana Use Compare With Others?

Of *female college students* across the country, about 16% used marijuana in the past month. That means most *female college students* across the country do not use marijuana.

What About Students At Virginia Tech?



Most VT students did not use marijuana in the past 30 days.

Based on your 10 days of reported use in the last month, you fall in to the yellow part of this graph.

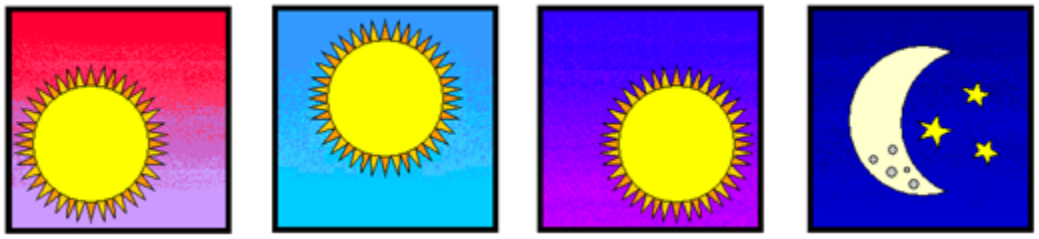
4% of Virginia Tech students use about as much marijuana as you do.

What do you make of this pie chart?

- I'm not sure I understand what this means.
- I'm not sure I believe this information.
- I don't believe that I use marijuana more than many other people... it seems like many others use marijuana more than me.
- That sounds about right to me. I assumed that was how I compared to other students.
- I'm surprised at the number. It always seems that plenty of other students used marijuana more than me, but I guess that there are also plenty of others who use it less than me.

During the past 30 days...

When you use, it is typically in the evening.



Over the last month, you said that you usually feel high about 3 hours on each day that you typically used marijuana.

In a typical month, you spend about $50 on marijuana. That's about $600 a year. With that money, you could buy...

466 iTunes Songs	*or*	150 Frappucinos	*or*	120 Lunches	*or*	60 Movie Tickets	*or*	9 Pairs of Sneakers
								

Drugs can sometimes lead to unintended consequences.

We asked you about a number of different problems related to your marijuana use.

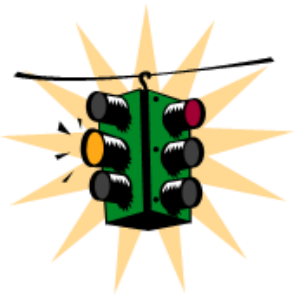
Out of **23 possible problems**, these are the ones that have affected you in the last 30 days:

- Not able to do your homework or study for a test.
- Missed out on other things because you spent too much money on marijuana.
- Went to work or school high.
- Neglected your responsibilities.
- Tried to control your marijuana use by trying to smoke only at certain times of the day or certain places.
- Missed a day (or part of a day) of school or work.
- Had a fight, argument, or bad feelings with a friend.
- Felt you were going crazy.
- Had a bad time.

Total Number of Problems:

9

Other experiences we asked about focus on the possibility that a person's regular marijuana use may lead to a more serious pattern of consequences.



The consequences below are red flags for that serious pattern of use.

1. Using marijuana in larger amounts, more often, or for a longer time than intended.

2. Being unable to cut down or stop using marijuana.

3. Spending a lot of time either getting marijuana, using marijuana, feeling the effects of marijuana, or waiting for the effects to wear off.

4. Gave up, reduced, or had problems at important activities at work, school, home or social events because of marijuana use.

5. Continuing to use marijuana even after knowing it was causing problems with:
   - health (breathing, coughing)
   - emotions (feeling less motivated, depressed, or anxious)
   - memory or concentration

6. Needing more marijuana to get the same high, or finding that the same amount did not get you as high as it used to.

7.
   - Having withdrawal problems from marijuana (like being irritable, anxious, having trouble sitting still or sleeping).
   - Continuing to use to avoid or stop withdrawal problems.

You reported 3 of 7 red flags.

Your risk of a serious pattern of use is:

High

We asked about whether any of your biological relatives have experiences problems related to substance use.

You indicated that no members of your family have had problems with drug use in the past.

Research has shown that having family members with a history of drug problems is a known risk factor for developing substance use problems.

Here are the reasons that you typically use marijuana:

- I use marijuana to forget my worries.
- I use marijuana because my friends pressure me to use marijuana.
- I use marijuana because it helps me when I feel depressed or nervous.
- I use marijuana to cheer up when I am in a bad mood.
- I use marijuana because I like the feeling.
- I use marijuana because it's exciting.
- I use marijuana to get high.
- I use marijuana because it makes social gatherings more fun.
- I use marijuana because it gives me a pleasant feeling.
- I use marijuana because I feel more confident and sure of myself.
- I use marijuana to celebrate a special occasion with friends.
- I use marijuana because it's fun.
- I use marijuana because it helps me to be more creative and original.
- I use marijuana so I can understand things differently.
- I use marijuana so I can expand my awareness.
- I use marijuana to be more open to experiences.

These are situations where you feel <u>less</u> confident that you could resist the temptation to smoke marijuana:

- On vacation
- Seeing someone else smoking marijuana and enjoying it
- In a pleasant social situation
- Having some time to yourself, free of responsibilities
- At a party where people were smoking marijuana
- With a spouse or close friend who was smoking marijuana
- Offered marijuana by someone

If you are thinking about reducing your marijuana use, you may want to try to learn how to handle these situations differently.

Life Goals

My Goals	My marijuana use affects this goal:	Reducing my marijuana use would affect this goal:
1) Trying to get good grades	Negatively	Very Positively
2) Trying to make lots of new friendships	Neutral	Positively
3) Trying to prepare myself for a career	Negatively	Very Positively
4) Trying to have fun during my college years	Positively	Neutral
5) Trying to find a significant other	Neutral	Neutral

Your Alcohol Use

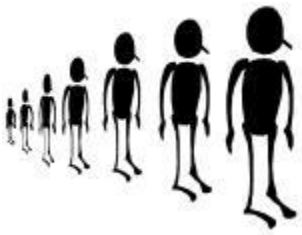
What about alcohol? Let's take a minute to look at how your alcohol use stacks up.

During the past 30 days, on average, you drank 8 days per month.

When you're drinking, you usually have 4 drinks.

One drink is equal to 12 ounces of beer, 4 ounces of wine, or 1.25 ounces of liquor:

How does your alcohol use compare with others?



Of *female college students* across the country, about 78% used alcohol in the past year.

About 63% used alcohol some time in the past month, and 4% used alcohol daily in the past month.

What do you think of this information?

- I'm not sure I understand what it means.
- I'm not sure I believe this information.
- I don't believe that I use alcohol more than many other people... it seems like many others use alcohol more than me.
- That sounds about right to me. I assumed that was how I compared to other students.
- I'm surprised at the number. It always seems that plenty of other students used alcohol more than me, but I guess that there are also plenty of others who use it less than me.

Thinking about cutting back or quitting?

If you decide you want to make a change in your marijuana or alcohol use (or any other health behavior) these are some tips to help you be successful.

AVOID temptations and triggers. If you're trying to quit or cut down, try to avoid situations where you'll be offered weed or tempted to use (at least at first).

ALTER routines. Believe it or not, craving and wanting to use can be affected by behavior and patterns you're in. Mix it up a little. Rearrange furniture, listen to different music, do something active at a time you'd normally be smoking or drinking. It will make cravings go away faster!

RELAX. Take time for yourself. Find things that help you to relax (video games, music, exercise, yoga, television) or even consider learning some relaxation or breathing strategies through various centers on campus.

REVIEW the reasons why you're doing this. What are the good things about quitting? What are the bad things about using? We often romanticize what use was like when we're tempted, and only remember the good things about use.

SUPPORT. Hey, you know those buddies you always smoke or drink with? Let them know what you're trying to do. The most well-intended friend who comes over to smoke or drink may not realize you're no longer using. Enlist allies -- they can root for you and help when you really want to use.

SUBSTITUTE things for your hands and mouth. Drink water. Keep your hands busy. Do something different at times you'd normally use.

REFUSE offers to use, and come up with ways to decline those offers now so that it sounds smoother when the offer happens.

BE PATIENT. Marijuana can really throw off the body, particularly with its impact on sleep, concentration, memory, etc. All that stuff will go back to normal, but just takes time. At first you might feel irritable, anxious, or have problems sleeping. In a way, that's a sign the body's healing itself.

FIGURE OUT what marijuana or alcohol did for you, then try to find healthy, drug-free alternatives for achieving that.

TREAT YOURSELF. Spend money you'd normally spend on marijuana or alcohol on other rewards. This shouldn't feel like punishment... have some fun!

Appendix D
Sample Education Control Report

Your Report

4/28/12

MFB Study
Virginia Tech

We'd like to give you a better understanding of what marijuana is and how it affects you.

What is marijuana?

- It is a dry, shredded green and brown mix of flowers, stems, seeds, and leaves of the hemp plant - Cannabis sativa. There are more than 200 slang terms for marijuana - Mary Jane, weed, pot, and grass are just a few.
- All forms of marijuana are mind-altering (psychoactive). In other words, they change how the brain works. They all contain THC (delta-9-tetrahydrocannabinol), the main active chemical in marijuana. They also contain more than 400 other chemicals.
- Marijuana's effects on the user depend on its strength or potency, which is related to the amount of THC it contains. The THC content of marijuana has been increasing since the 1970s. For the year 2006, most marijuana contained, on average, 7 percent THC.
- It has effects similar to those of depressants, stimulants, and hallucinogens but does not fit neatly into any of these categories.

How is marijuana used?

- Marijuana is usually smoked as a cigarette (joint) or in a pipe or bong. It is also smoked in blunts, which are cigars that have been emptied of tobacco and refilled with marijuana.
- Marijuana can also be mixed in food or brewed as a tea.
- The effects of smoked marijuana can last from 1 to 3 hours. If marijuana is consumed in foods or beverages, the effects appear later - usually in 30 minutes to 1 hour - but can last up to 4 hours.

Why do people use marijuana?

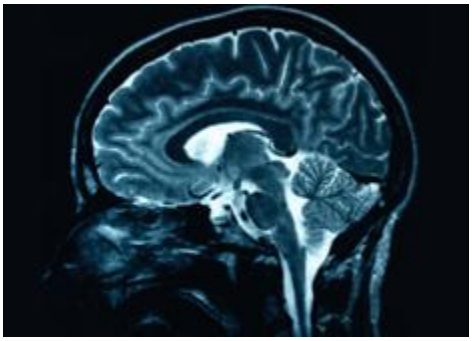
- These are some of the common reasons people give for using marijuana:
  - Mild euphoria
  - Relaxation
  - Perceptual alterations (intensification of experiences like music,

eating and films)
- Increased talkativeness and laughter
- Helps handle emotions and problems

How long does marijuana stay in the body?

- THC is absorbed by fatty tissues in the body.
- Depending on how marijuana is used, the body absorbs, breaks down and gets rid of THC differently.
- THC can be detected in urine, hair, sweat, and blood.
- THC can be detected by standard urine testing methods several days after a smoking session.
- THC can be detected in the body of heavy users for as long as 28 days after the last use, though most users don't test positive after that amount of time.

How does marijuana affect the brain?



- Researchers have learned a great deal about how THC acts in the brain. When someone smokes marijuana, marijuana reaches the brain within a few minutes.
- THC acts upon specific sites in the brain, called cannabinoid receptors, kicking off a series of reactions that ultimately lead to the "high" feeling.
- Some brain areas have many cannabinoid receptors; others have few or none. The highest density of cannabinoid receptors are found in parts of the brain that influence pleasure, memory, thoughts, concentration, sensory and time perception, and coordinated movement.

Is marijuana addictive?

- Most people who use marijuana do not become addicted to it. However, long-term marijuana use can lead to addiction in some people. Some frequent, heavy marijuana users develop "tolerance" to its effects. This means they need larger and larger amounts of marijuana to get the same desired effects as they used to get from smaller amounts.

- Long-term heavy marijuana users trying to quit report several symptoms of withdrawal - like irritability, sleeplessness, decreased appetite, anxiety, and craving. These symptoms begin within about 1 day after quitting, get the worst at 2-3 days after quitting, and go away within 1 or 2 weeks.

What do you think of this information?

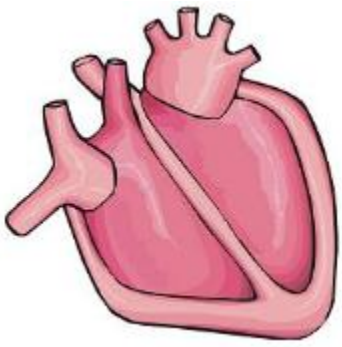
- I'm not sure I understand it.
- I'm not sure I believe this information.
- It seems accurate to me.

Does marijuana use lead to use of other drugs?

- In a recent study, the majority of marijuana users (63%) did not go on to use other drugs. The study also found that 99% of those who use drugs other than marijuana had previously used marijuana.
- The conclusion is that marijuana use does not inevitably lead to other drug use.

What are marijuana's health effects?

The Heart



- Marijuana increases heart rate by 20-100 percent shortly after smoking; this effect can last up to 3 hours.
- Because of the effect on heart rate, there may be an increased risk for heart attack after smoking marijuana, but that increased risk doesn't affect most individuals.
- There is no current evidence that marijuana smoke produces permanent damage to the heart.

The Lungs

- Numerous studies have shown marijuana smoke to contain carcinogens and to be an irritant to the lungs. In fact, marijuana smoke contains 50-70 percent more carcinogenic hydrocarbons than does tobacco smoke.

- Marijuana users usually inhale more deeply and hold their breath longer than tobacco smokers do, which increase the lungs' exposure to carcinogenic smoke.
- Marijuana smokers can have many of the same respiratory problems as tobacco smokers, such as daily cough and phlegm production, more frequent acute chest illness, and a heightened risk of lung infections.
- However, a recent study found no positive associations between marijuana use and lung, upper respiratory, or upper digestive tract cancers.

How does marijuana affect learning and memory?

- Long-term daily pot use may have some subtle short-term effects on memory and attention. Being under the influence of marijuana can impair:
  - Concentration
  - Ability to maintain attention
  - Memory
  - Ability to organize information
- Research has shown that marijuana's impact on learning and memory can last for days or weeks after the immediate effects wear off.
- However, there's no evidence that marijuana permanently impacts intelligence or causes brain damage. Cognitive impairments have been shown to disappear after 28 days of not smoking.

What do you think of this information?

- I'm not sure I understand it.
- I'm not sure I believe this information.
- It seems accurate to me.

Why do people use marijuana medically?

- THC, the active chemical in marijuana, is manufactured into a pill available by prescription that can be used to treat the nausea and vomiting that occur with certain cancer treatments and to help AIDS patients eat more to keep up their weight.
- Cannabinoids may also help ease pain in various illnesses.
- Scientists are studying whether the chemicals in marijuana may have other medical uses. Because of the adverse effects of smoking marijuana, research on other cannabinoids appears more promising for the development of new medications.

What are some of the arguments in the debate on whether marijuana should be legalized?

- Here's what some people believe about why marijuana should be legalized:
  - The government could tax marijuana and regulate sales by setting a minimum age for use, limiting the hours of sale, or imposing high taxes to discourage use, especially by minors.
  - It would be possible to educate people about "safer" ways of using marijuana instead of promoting no use as the only alternative.
  - By removing criminal activity from the marijuana trade, both people who smoke and their communities could be safer.

- Here's what some people believe about why marijuana should not be legalized:
  - Legalizing or decriminalizing marijuana would send a message of tolerance.
  - Using, growing and selling needs to be illegal to prevent young people from using.
  - If marijuana sales were legal and regulated by the government, the price would likely decrease, making it easier for people to purchase and likely increasing the number of people who use.
  - More users would mean more regular users which would likely lead to more people experiencing dependence and marijuana related problems.

How does marijuana affect driving?

- Marijuana has been shown to impair skills important in driving including:
  - Alertness
  - Concentration
  - Coordination
  - Reaction time
- Marijuana use can make it difficult to judge distances and react to signals and sounds on the road. Marijuana may play a role in motor vehicle crashes.

- In one study conducted in Memphis, TN, researchers found that, of 150 reckless drivers who were tested for drugs at the arrest scene, 33 percent tested positive for marijuana. Data have also shown that while smoking marijuana, people show the same lack of coordination on standard sobriety tests (like touching your finger to your nose) as do people who have had too much to drink.

Alcohol impacts driving more negatively than marijuana. While alcohol tends to increase aggressiveness and risk taking, drivers who have smoked marijuana tend to drive more slowly and cautiously. Driving after using both marijuana and alcohol is more dangerous than using either substance alone.

Appendix E
Screening Assessment

A. What is your age?

_____

B. Are you a VT student?

_____ (1) Yes (0) No

C. How did you hear about the MFB project?

_____ (1) SONA posting
_____ (2) Flyer
_____ (3) From another VT student
_____ (4) From some other source (Specify:_____)
_____ (5) Don't know

D. During the past 30 days, on how many days did you use any kind of marijuana or hashish?

_____ days

E. Some people are happy with their use of marijuana and aren't planning to make any changes. Some people think about the possibility of quitting, getting high less often, or making other changes. How do you feel about your marijuana use right now?

____ (1) I'm basically satisfied with my use of marijuana and do not plan to change it. (*Precontemplation*)
____ (2) I'm thinking about stopping or reducing my use of marijuana, but I don't think I'll begin doing that in the next 30 days. (*Contemplation*)
____ (3) I think I will stop or reduce my use of marijuana sometime in the next 30 days. (*Preparation*)
____ (4) Sometime within the past 6 months I stopped or reduced my level of marijuana use and I've not returned to my previous level of use. (*Action*)
____ (5) More than 6 months ago, I stopped or reduced my level of marijuana use and I've not returned to my previous level of use. (*Maintenance*)

Appendix F
Cannabis Use Problems Identification Test

Some people can use marijuana without developing any serious problems. Others can experience health problems, or other kinds of problems. If you answer the questions below, it can help you to work out if you are having any problems with marijuana. There are no right or wrong answers. For each question, please select the answer closest to your marijuana use over the past 12 months.

1. On how many days have you used marijuana during the past 12 months? (If there was no pattern to you marijuana use, please make your best estimate.)
    ___ 1 – 6 days (less than one day a month)
    ___ 7 – 12 days (an average pattern of one day a month)
    ___ 13 – 36 days (an average pattern of 2 – 3 days a month)
    ___ 37 – 52 days (an average pattern of one day a week)
    ___ 53 – 104 days (an average pattern of 2 days a week)
    ___ Up to 208 days (an average pattern of 3 – 4 days a week)
    ___ Up to 312 days (an average pattern of 5 – 6 days a week)
    ___ Up to 365 days (daily/most days)

2. Now please think about your recent marijuana use. On how many days have you used marijuana over the past 3 months (90 days)?
    ___ No days
    ___ 1 – 2 days (less than one day a month)
    ___ 3 – 4 days (an average pattern of one day a month)
    ___ 5 – 9 days (an average pattern of 2 – 3 days a month)
    ___ 10 – 15 days (an average pattern of one day a week)
    ___ 16 – 26 days (an average pattern of 2 days a week)
    ___ 27 – 52 days (an average pattern of 3 – 4 days a week)
    ___ 53 – 78 days (an average pattern of 5 – 6 days a week)
    ___ 79 – 90 days (daily/most days)

Over the past 3 months:

3. How many times would you use marijuana on a typical day when you were using? (Note: at least one hour between each new ‘use’)
    ___ Once
    ___ Twice
    ___ 3 – 4 times
    ___ 5 – 6 times
    ___ 7 – 9 times
    ___ 10 or more times

4. How often have you used marijuana first thing in the morning?
    ___ Never
    ___ Once or twice
    ___ Less than monthly
    ___ Monthly

___ One day a week
___ Several days a week
___ Daily/Always

5. How much of the average day do you spend/or feel stoned?
___ 0 hours
___ 1 – 2 hours
___ 3 – 4 hours
___ 5 – 6 hours
___ 7 – 8 hours
___ 9 or more hours

6. How difficult do you think you would find it to stop using or go without marijuana altogether?
___ Not at all difficult
___ A bit difficult
___ Quite difficult
___ Very difficult
___ Impossible

7. What was the longest time you went without using marijuana?
___ 6 months or longer
___ 3 – 5 months
___ 1 – 2 months
___ 2 – 3 weeks
___ One week
___ 4 – 6 days
___ 2 – 3 days
___ One day
___ No days at all

8. Have you felt that you needed marijuana?
___ Never
___ Sometimes
___ Quite often
___ Very often
___ Always/All the time

9. Have you been able to stop using marijuana when you wanted to?
___ Never/At no time
___ Sometimes (not often)
___ Quite often (half the time)
___ Very often (usually)
___ Always/All the time

10. Have you found it difficult to get through a day without using marijuana?
___ Never

___ Sometimes
___ Quite often
___ Very often
___ Always/All the time

11. Did your use of marijuana ever interfere with (get in the way of) your work at school, your job, or your home life?
    ___ Never
    ___ Sometimes
    ___ Quite often
    ___ Very often
    ___ Always/All the time

12. Have you lacked the energy to get things done in the way you used to?
    ___ Never
    ___ Sometimes
    ___ Quite often
    ___ Very often
    ___ Always/All the time

13. Have you given up things you used to enjoy or were important because of marijuana? (e.g., work, school, sports, hobbies, being with family and friends, etc.)
    ___ None at all/Nothing
    ___ One or two things
    ___ Quite a few things
    ___ Lots of things
    ___ Everything

14. Has anything you had planned, or were expected to do, not happened after using marijuana? (e.g., a family outing, chores, taking care of children, homework, an assignment, appointment, job interview, training, attending school or work, etc.)
    ___ Never
    ___ Sometimes
    ___ Quite often
    ___ Very often
    ___ Always/All the time

15. Have you had problems concentrating and remembering things?
    ___ Never
    ___ Sometimes
    ___ Quite often
    ___ Very often
    ___ Always/All the time

16. Did you ever use marijuana after you had decided not to?
    ___ Never
    ___ Sometimes

___ Quite often
___ Very often
___ Always/All the time

Appendix G
Demographics Questionnaire

1) What is your age? _____

2) What is your sex?
____ (0) Male ____ (1) Female

3) Are you Hispanic or Latino? _____ (0) No _____(1) Yes
3a) To which racial group do you belong?
(0) _____ Alaska Native/Eskimo
(1) _____ Asian/Asian American
(2) _____ Black/African American
(3) _____ Hawaiian/Pacific Islander
(4) _____ Native American/American Indian
(5) _____ White/Caucasian
(6) _____ Multi-Racial
(7) _____Other :_____

4) What is your marital status?
____ (0) never married
____ (1) married
____ (2) separated
____ (3) divorced
____ (4) widowed
____ (5) cohabiting (living with a significant other)

5) What is your current employment status?
____ (0) employed full time
____ (1) employed part time
____ (2) homemaker
____ (3) full time student
____ (4) part time student
____ (5) unemployed
____ (6) disabled and not working
____ (7) self-employed
____ (8) retired

6) What is your year in college?
____ (1) One
____ (2) Two
____ (3) Three
____ (4) Four or higher

Appendix H
Assessment of Marijuana, Alcohol, and Other drug use

We would like to ask you about your experiences with marijuana. We also want to ask some questions about alcohol and other drugs.

These questions will be asking about the past 30 days.

1) During the past 30 days, on how many days did you use any kind of marijuana?
   _____ days

2) During the past 30 days, on average, how much marijuana per week do you think you used in ounces?

   ___ (1) Less than 1/16th
   ___ (2) 1/16th
   ___ (3) 1/8th
   ___ (4) 1/4th
   ___ (5) 3/8th
   ___ (6) 1/2
   ___ (7) 5/8th
   ___ (8) 3/4th
   ___ (9) 7/8th
   ___ (10) 1
   ___ (11) More than 1

3) During the past 30 days, on average, how much money did you spend per week on marijuana?
   $_____per week

4) During the past 30 days, when you smoked, how many hours per day did you feel high on average?
   _____ hours per day

5) During the past 30 days, on a typical day when you smoked, how many times per day did you get high on average (at least a 30 minute time interval is necessary to count as separate "times")?
   _____ times per day

6) During the past 30 days, what was your typical source of marijuana (select one)?
   ___ (1) I bought it
   ___ (2) I grew it myself
   ___ (3) I received it as a gift
   ___ (4) Other (please specify)_____

7) During the past 30 days, what was your typical way of using marijuana (select one)?
   ___ (1) Smoked it in a joint
   ___ (2) Smoked it in a pipe (or bong)
   ___ (3) Smoked it in a cigar wrapper (or blunt)
   ___ (4) Consumed it orally
   ___ (5) Other (please specify)_____

8) During the past 30 days, when did you typically smoke? (please check all that apply)
   ___ (1) Mornings (6am - noon)

___ (2) Afternoons (noon - 6pm)
___ (3) Evenings (6pm - midnight)
___ (4) Nights (midnight - 6am)

9) How old were you when you smoked marijuana for the first time?
_____ years

10) At what age did you first smoke marijuana on a daily or a near daily basis? A daily or nearly daily basis, for our purposes, means that you smoked five or more days per week and you did it at that rate for at least a month.
_____ years

11) During the past 30 days, did you purposefully stop, try to stop, cut down or try to limit your use of marijuana? (We are not referring to times that you stopped or cut back because you were pressured to or unable to get marijuana [like if there was mandatory drug testing, if you were someplace where you couldn't get marijuana, etc.], but rather because you purposefully stopped smoking.)
___ (1) Yes
___ (2) No

12) During the past 30 days, on how many days did you use any kind of alcohol?
_____ days

12a. During the past 30 days, how many standard drinks did you have on a typical drinking day?
One Standard drink = 1 1/4 oz. liquor = 5 oz. wine = 12 oz beer
For example, 40oz beer = 3.5 drinks

_____ drinks

13) During the past 30 days, how often did you have 6 or more drinks in a single day?

____ (0) Never
____ (1) Less than weekly
____ (2) Weekly
____ (3) Less than daily
____ (4) Daily or almost daily

14) During the past 30 days, how many days did you use any drugs other than marijuana?

_____ days

15) During this past 30 days, were there any days where you used sedatives or hypnotics? (This includes things like barbiturates, "downers", "sleeping pills", benzodiazepines, Quaaludes, Xanax, Ativan, Valium, Klonopin, Librium, Thorazine, hypnotics, tranquilizers, or anti-anxiety drugs.)

___ (1) Yes

___ (2) No (if no skip to question 16)

15a. On how many days during the past 30 days did you use sedatives or hypnotics?

_____ days

16) During this past 30 days, were there any days where you used stimulants or amphetamines? (This includes things like stimulants, amphetamines, methamphetamine, Ritalin, Dexedrine, Ephedrine, speed, uppers, and pep pills)

___ (1) Yes
___ (2) No (if no skip to question 17)

16a. On how many days during the past 30 days did you use stimulants or amphetamines?

_____ days

17) During this past 30 days, were there any days where you used opioids? (This includes things like any kind of heroin, heroin mixed with other drugs (speedball, Karachi), opium, Oxycotin/Oxycodone, pain killers (Percocet, Percodan, Vicodin), morphine, codeine or other opioids)

___ (1) Yes
___ (2) No (if no skip to question 18)

17a. On how many days during the past 30 days did you use opioids?

_____ days

18) During this past 30 days, were there any days where you used cocaine? (This includes things like coke, crack, snow, blow, and rock)

___ (1) Yes
___ (2) No (if no skip to question 19)

18a. On how many days during the past 30 days did you use cocaine?

_____ days

19) During this past 30 days, were there any days where you used hallucinogens? (This includes things like LSD, acid, mescaline, peyote, mushrooms, PCP, Ecstasy/MDMA, psilocybin, or special k/ Ketamin.)

___ (1) Yes
___ (2) No (if no skip to question 20)

19a. On how many days during the past 30 days did you use hallucinogens?

_____ days

20) During this past 30 days, were there any days where you used inhalants? (This includes things like Nitrous Oxide, glue, gasoline, Amyl Nitrite, spray paints or paint thinner.)

___ (1) Yes
___ (2) No (if no skip to question 21)

20a. On how many days during the past 30 days did you use inhalants?

_____ days

21) During this past 30 days, were there any days where you used steroids? (This includes both oral and injectable steroids such as Anadrol and Durabolin)

___ (1) Yes
___ (2) No (if no skip 21a)

21a. On how many days during the past 30 days did you use steroids?

_____ days

22) On how many days do you think the **average VT student** used any kind of **marijuana** in the past 30 days?
_____ days

23) On how many days do you think the **average VT student** used any kind of **alcohol** in the past 30 days?
_____ days

24) On how many days do you think the **average VT student** used any kind of **drugs other than marijuana** in the past 30 days?
_____ days

Appendix I
Family History of Drug Problems

1. To your knowledge, do you have any biological relatives that have a significant substance use problem — one that should or did lead to treatment?

   Mother or Father
   ___ (1) Yes
   ___ (2) No

   Brothers or Sisters
   ___ (1) Yes
   ___ (2) No

   Grandparents
   ___ (1) Yes
   ___ (2) No

   Uncles or Aunts
   ___ (1) Yes
   ___ (2) No

   First Cousins
   ___ (1) Yes
   ___ (2) No

2. How often do you think about how your family history impacts your own substance use?
   ___ Never
   ___ Sometimes
   ___ Quite often
   ___ Very often
   ___ Always/All the time

3. How much are you concerned about your family history of substance use?
   ___ Not at all
   ___ A little bit
   ___ Moderately
   ___ Quite a bit
   ___ Extremely

Appendix J
Treatment Utilization Questionnaire

Now I'm going to ask about your use of treatments or services that you may have received in the past 30 days.

1. **During this time period, how many days did you spend in a hospital or treatment program where you stayed overnight for any reason?**

   Total number of hospital days: _____
   If treatment was received, describe briefly:

2. **During this period, how many days were there when you saw a doctor, dentist, nurse, nurse-practitioner, or physician's assistant for any kind of medical care on an outpatient basis**?

   Total days seen for medical care: _____

3. **During this period, on how many days did you have a session with a counselor or therapist**?

   Total days seen for counseling or therapy: _____
   If treatment was received, describe briefly:

4. **During this period, on how many days did you attend a Twelve-Step meeting?**

   Total days attending Twelve-Step meetings: _____

5. **During this period, on how many days did you take any medications prescribed by a physician?**

   Total days taking prescription medicines: _____
   Specify:

Appendix K
MPI

We're going to ask you to think about how marijuana use has affected you. We have a list of some of the things that different people might experience when using marijuana.

Please indicate how often the following have happened **in the last 30 days** while you were using **marijuana** or because of your **using marijuana**.

	Never	**1-2 Times**	**3-5 Times**	**6-10 Times**	**More than 10 Times**
1. Not able to do your homework or study for a test.					
2. Got into fights, acted bad or did mean things.					
3. Missed out on other things because you spent too much money on marijuana.					
4. Went to work or school high.					
5. Caused shame or embarrassment to someone.					
6. Neglected your responsibilities.					
7. Relatives avoided you.					
8. Felt that you needed MORE marijuana than you used to in order to get the same effect.					
9. Tried to control your marijuana use by trying to smoke only at certain times of the day or certain places.					
10. Had withdrawal symptoms, that is felt sick (irritated or anxious) because you stopped or cut down using marijuana.					
11. Noticed an ongoing or unpleasant change in your personality.					
12. Felt that you had a problem with marijuana.					
13. Missed a day (or part of a day) of school or work.					
14. Tried to cut down or quit smoking marijuana.					
15. Suddenly found yourself in a place you could not remember getting to.					
16. Passed out or fainted suddenly.					
17. Had a fight, argument, or bad feelings with a friend.					
18. Had a fight, argument, or bad feelings with a family member.					

	Never	**1-2 Times**	**3-5 Times**	**6-10 Times**	**More than 10 Times**
19. Kept smoking marijuana when you promised yourself not to.					
20. Felt you were going crazy.					
21. Had a bad time.					
22. Felt physically or psychologically dependent on marijuana.					
23. Was told by a friend or neighbor to cut down on smoking marijuana.					

Appendix L
Abuse and Dependence Symptom Assessment

Next, we want to go over another list of experiences that can be related to marijuana use. For each of the following statements, we would like you to tell us if you have had this experience in the past 30 days by responding yes or no.

Have you noticed any of the following things happen to you in the past 30 days because of your marijuana use?

	No	Yes
1. You kept using marijuana even though you knew it was keeping you from meeting your responsibilities at school (like attending classes, doing your homework or studying for tests).	**0**	**1**
2. You kept using marijuana even though you knew it was keeping you from meeting your responsibilities at home (like doing household chores or coming home on time).	**0**	**1**
3. You kept using marijuana even though you knew it was keeping you from meeting your responsibilities at work (like doing a good job or getting to work on time).	**0**	**1**
4. You used marijuana where it made the situation unsafe or dangerous for you, such as when you were driving a car or using a machine.	**0**	**1**
5. You used marijuana where it made the situation unsafe or dangerous for you, like a situation where you might have been forced into sex or hurt.	**0**	**1**
6. Your marijuana use caused you to have (repeated) problems with the law.	**0**	**1**
7. You kept using even after you knew it was causing you problems with other people, like family members, friends, or people at school or work (like arguments or fights).	**0**	**1**
8. You needed more marijuana to get the same high or found that the same amount did not get you as high as it used to.	**0**	**1**
9. You had withdrawal problems from marijuana like being irritable, anxious, having trouble sitting still or sleeping.	**0**	**1**
10. You continued to use to avoid or stop withdrawal problems like being irritable, anxious, having trouble sitting still or sleeping.	**0**	**1**
11. You used marijuana in larger amounts, more often or for a longer time than you meant to.	**0**	**1**
12. You were unable to cut down or stop using marijuana.	**0**	**1**
13. You spent a lot of time either getting marijuana, using marijuana, feeling the effects of marijuana, or waiting for the effects to wear off.	**0**	**1**
14. Your use of marijuana caused you to give up, reduce or have problems at important activities at work, school, home, or social events.	**0**	**1**

	No	Yes
15. You kept using marijuana even after you knew it was causing or adding to medical/physical problems you were having (like breathing or coughing problems, burning in lungs, headaches).	**0**	**1**
16. You kept using marijuana even after you knew it was causing or adding to psychological or emotional problems you were having (like decreased motivation, feeling depressed or anxious).	**0**	**1**
17. You kept using marijuana even after you knew it was causing or adding to problems you were having with concentration or memory.	**0**	**1**

Appendix M
Marijuana Motives Measure

Because people use marijuana for different reasons, we're interested in what your reasons are for smoking marijuana. The following is a list of reasons people sometimes give for using marijuana.
Instructions: Thinking of all the times you use marijuana, how often would you say that you use marijuana for each of the following reasons?

	Almost Never/ Never	Some of the Time	Half of the Time	Most of the Time	Almost Always/ Always
1. I use marijuana to forget my worries.	1	2	3	4	5
2. I use marijuana because my friends pressure me to use marijuana.	1	2	3	4	5
3. I use marijuana because it helps me enjoy a party.	1	2	3	4	5
4. I use marijuana because it helps me when I feel depressed or nervous.	1	2	3	4	5
5. I use marijuana to be sociable.	1	2	3	4	5
6. I use marijuana to cheer up when I am in a bad mood.	1	2	3	4	5
7. I use marijuana because I like the feeling.	1	2	3	4	5
8. I use marijuana so that others won't kid me about not using marijuana.	1	2	3	4	5
9. I use marijuana because it's exciting.	1	2	3	4	5
10. I use marijuana to get high.	1	2	3	4	5
11. I use marijuana because it makes social gatherings more fun.	1	2	3	4	5
12. I use marijuana to fit in with a group I like.	1	2	3	4	5
13. I use marijuana because it gives me a pleasant feeling.	1	2	3	4	5
14. I use marijuana because it improves parties and celebrations.	1	2	3	4	5
15. I use marijuana because I feel more confident and sure of myself.	1	2	3	4	5
16. I use marijuana to celebrate a special occasion with friends.	1	2	3	4	5
17. I use marijuana to forget my problems.	1	2	3	4	5
18. I use marijuana because it's fun.	1	2	3	4	5
19. I use marijuana to be liked.	1	2	3	4	5
20. I use marijuana so I won't feel left out.	1	2	3	4	5
21. I use marijuana so I can know myself better.	1	2	3	4	5
22. I use marijuana because it helps me to be more creative and original.	1	2	3	4	5
23. I use marijuana so I can understand things differently.	1	2	3	4	5
24. I use marijuana so I can expand my awareness.	1	2	3	4	5
25. I use marijuana to be more open to experiences.	1	2	3	4	5

Appendix N
Self-Efficacy Scale

Instructions: Please rate how confident you would be that you could resist the temptation to smoke marijuana in the following situations.

"**1**" means you are not at all confident & "**7**" means you are extremely confident.

How confident are you that you could resist the temptation to smoke marijuana if you were:	**Not at all** Confident						**Very** Confident
	1	**2**	**3**	**4**	**5**	**6**	**7**
1. Having to do some monotonous work	1	2	3	4	5	6	7
2. Wanting to feel more confident	1	2	3	4	5	6	7
3. On vacation	1	2	3	4	5	6	7
4. Seeing someone else smoking marijuana and enjoying it.	1	2	3	4	5	6	7
5. Feeling depressed or worried	1	2	3	4	5	6	7
6. Drinking alcohol	1	2	3	4	5	6	7
7. Feeling like celebrating some good news or accomplishment	1	2	3	4	5	6	7
8. Feeling frustrated	1	2	3	4	5	6	7
9. Wanting to feel better about yourself	1	2	3	4	5	6	7
10. Feeling angry about something or someone	1	2	3	4	5	6	7
11. In a pleasant social situation	1	2	3	4	5	6	7
12. Having some time to yourself, free of responsibilities	1	2	3	4	5	6	7
13. Using other drugs recreationally	1	2	3	4	5	6	7
14. At a party where people were smoking marijuana	1	2	3	4	5	6	7
15. Feeling embarrassed	1	2	3	4	5	6	7
16. With a spouse or close friend who was smoking marijuana	1	2	3	4	5	6	7
17. In an uncomfortable social situation	1	2	3	4	5	6	7
18. Offered marijuana by someone	1	2	3	4	5	6	7
19. Bored with nothing to do	1	2	3	4	5	6	7
20. Stressed out and needing to calm down	1	2	3	4	5	6	7

Appendix O
Life Goals Assessment

We are interested in the things that you typically are trying to do or would like to accomplish in the future. In other words, the goals you have in different areas of your life.

Here are some examples of goals:

Trying to get along with others
Trying to develop my spirituality
Trying to help others in need of help
Trying to seek new and exciting experiences
Trying to avoid feeling inferior to others
Trying to develop and maintain close relationships
Trying to avoid conflict with my spouse or partner
Trying to advance in my career

- **Goals are things that you are "trying" to do, whether or not you are actually successful is not important. For example, you might "try to save money" without necessarily being successful.**
- **These goals may be broad, such as "trying to make others happy" or more specific "trying to make my partner happy". Also note that goal can be either positive or negative. That is, they may be about something you typically try to get or keep, or things that you typically try to avoid or prevent. For example, you might typically try to obtain attention from others, or you might typically try to avoid calling attention to yourself.**
- **You might find it useful to think about your goals in different domains of your life: work and school, home and family, social relationships, and leisure/recreation. Think about all of your desires, goals, wants, and hopes in these different areas.**

Type in 5 goals.

Then rate how you think your current use of marijuana affects each of your goals by entering in the appropriate number.
Note: If you have recently stopped smoking, please leave enter Not Applicable for this question.

Next, rate how you think reducing your use of marijuana would affect each of your goals by writing in the appropriate number.

Goals	Current marijuana use affects goals	Reducing marijuana use affects goals
	My Current Marijuana Use Affects My Goal: 1 = Very Positively 2 = Positively 3 = Neutrally 4 = Negatively 5 = Very Negatively	Reducing My Marijuana Use Would Affect My Goal: 1 = Very Positively 2 = Positively 3 = Neutrally 4 = Negatively 5 = Very Negatively
1.		
2.		
3.		
4.		
5.		

Appendix P
Marijuana Goals Assessment

As you know, different people have very different goals for changing (or not changing) their marijuana use. We'd like to know what your personal goal is.

1. Today, what is your marijuana use goal for the next 6 months? Select the ONE response that best captures your personal goal.
   ___a. My goal is to not use marijuana at all (skip question 2).
   ___b. My goal is to reduce my use, but not stop using completely.
   ___c. I don't have any goals to change my use (skip question 2).

2. If your goal is to reduce your marijuana use, but not stop using completely, which of the following best describes your personal goal? Select ONE response.
   ___a. to use marijuana occasionally, but less than once per month
   ___b. to use marijuana monthly, but less than once per week
   ___c. to use marijuana 1 or 2 days per week
   ___d. to use marijuana on 3 to 5 days per week
   ___e. to use marijuana on 6 to 7 days per week

3. How important is this goal to you right now compared to other goals you have? Circle ONE number below that indicates the degree of importance.

1	2	3	4	5	6	7
Not at all Important			Moderately Important			Extremely Important

4. How confident are you that you will be able to achieve your personal goal over the next 6 months? Circle ONE number below that indicates your degree of confidence.

1	2	3	4	5	6	7
Not at all Confident			Moderately Confident			Extremely Confident

Please read each of the following statements carefully. Circle ONE number below each statement to indicate the degree to which you AGREE or DISAGREE with the statement at this time. The word "goal" in each statement refers to the personal marijuana use goal you indicated on Question 1.

5. It's hard for me to take this goal seriously.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. It's unrealistic for me to expect to reach this goal.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. It's quite likely that this goal may need to be revised, depending on how things go.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. Quite frankly, I don't care if I achieve this goal or not.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. I am strongly committed to pursuing this goal.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

10. It wouldn't take much to make me abandon this goal.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

11. I think this goal is a good goal for me to shoot for.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Appendix Q
Manipulation Check

We would like to get your impression of questionnaires you completed and the feedback report that you just viewed. On this page, there is a series of statements about some of the ways that people may feel or think about the information they just received. Please respond to each of the items by circling the number that indicates how you feel.

1) I am satisfied with the report I just received.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

2) Filling out the online questionnaires was helpful.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

3) Filling out the online questionnaires took too much time.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

4) The feedback gave me a new way of looking at my marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

5) The report I received was interesting.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

6) I don't think that the information I received was accurate.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

7) I read my report in detail.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

8) The report was very balanced and neutral.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

9) I wanted a type of information not offered by this project.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

If agree (4 or 5), please describe:_____

10) Getting the report was helpful.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

11) I learned about what marijuana is and how it is used.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

12) The report I received led me to re-think my own marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

13) I learned from my report how marijuana affects several different aspects of physical health.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

14) I learned about how my use relates to other people's use.

1	2	3	4	5	N/A
Strongly	Disagree	Neutral	Agree	Strongly	Don't

Disagree				Agree	Know

15) The report described whether marijuana can be addictive.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

16) The report described aspects of my own problems related to marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

17) I got information about medical issues related to marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

18) After viewing the report, I feel that I want to cut down on my marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

19) The report gave me information about legal issues related to marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know

20) The information in the report makes me wonder whether I should get treatment for my marijuana use.

1	2	3	4	5	N/A
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know