Public Perceptions and Attitudes Toward Adolescent Marijuana Use: Results of a Statewide Survey

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Abstract
The purpose of the current study is to examine patterns in public perceptions and attitudes toward marijuana use among adolescents. Computer-assisted telephone interviewing (CATI) was used to collect data from a statewide sample of adults in Michigan identified through random-digit dialing (n = 560). CATI interviews were supplemented with web- and paper-based surveys for nonrespondents. We used latent class analysis to characterize patterns in public perception, using a vignette technique that assessed (a) whether adults recognize adolescent marijuana use as a problem, (b) how they view the efficacy of treatment, (c) how they view help-seeking with mental health professionals, and (d) whether they support prevention services for adolescents. Multinomial logistic regression was used to examine the relationship between class membership and demographics, substance use, and methodological factors. Three latent classes were identified: (a) a discriminating group, (b) a low-concern group, and (c) a high-concern group. Age and substance use were among the strongest determinants for membership in the discriminating group. Results provide insight into how the general public perceives marijuana use and marijuana-related problems among adolescents.

Keywords
public perception, marijuana, adolescents, latent class analysis

Introduction
Marijuana is the world’s most commonly used illicit substance and estimates suggest there are between 119 and 224 million marijuana users worldwide (UN Office on Drugs and Crime, 2012). Estimates from the National Survey on Drug Use and Health suggest that there are 18.1 million current (past month) marijuana users in the United States (SAMHSA, 2012). Among American illicit drug users, roughly two thirds (64.3%) report the use of only marijuana (SAMHSA, 2012). Marijuana use often begins during adolescence1 and by 12th grade, 36% of young people in the United States report past-year marijuana use (Johnston, O’Malley, Bachman, & Schulenberg, 2012). Rates of recent (past 30 day) marijuana use among adolescents now exceed rates of cigarette use among that age group (15.2% and 11.7%, respectively; Johnston et al., 2012). Annual prevalence data have also documented increases in the rates of marijuana use among American adolescents between 2008 and 2011 (Johnston et al., 2012). Among adolescents and young adults who use marijuana, approximately 26% meet Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000) criteria for marijuana abuse or dependence (Wu, Woody, Yang, Pan, & Blazer, 2011). Approximately half of the individuals who enter treatment for marijuana use are below the age of 25 (Budney, Roffman, Stephens, & Walker, 2007).

While marijuana use is relatively common, it has been connected to several adverse outcomes, particularly among adolescents. Adolescent marijuana use has been associated with an increased risk of a range of negative health outcomes, including future depression and anxiety disorders (Rey, Martin, & Krabman, 2004), fatal automobile crashes (Asbridge, Hayden, & Cartwright, 2012), accidental injuries, chronic bronchitis, and respiratory infections (Hall & Degenhardt, 2009). As adolescent brains are still developing, the results of frequent marijuana use are a particular concern among this age group. Frequent marijuana use among adolescents can have a detrimental impact on cognitive functioning and may affect functional and structural development in areas of the brain involved in higher intellectual capabilities (Lisdahl, Nagel, & Tapert, 2010; Schweinsburg, Brown, & Tapert, 2008). A recent prospective study of more than

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1,000 people, for example, found individuals who used marijuana heavily in adolescence and continued through adulthood showed a significant drop in IQ between the ages of 13 and 38 (Meier et al., 2012). Under the influence of marijuana, adolescents also may display impaired judgment, contributing to risky behaviors such as unprotected sex, driving under the influence, or riding with an intoxicated driver (Gruber & Pope, 2002). Earlier age of onset for marijuana use is associated with increased risk of developing substance-use problems (Brook, Brook, Zhang, Cohen, & Whitman, 2002; Lynskey et al., 2003).

Despite these potential consequences, the levels of perceived risk and disapproval of marijuana among adults and adolescents are low and steadily declining (Gallup, 2011; Johnston et al., 2012). When Gallup, for example, first surveyed adults in the United States regarding marijuana legalization in 1969, only 12% favored it. Results of a more recent survey indicate that 50% of Americans now support marijuana legalization (Gallup, 2011). Among adolescents, the perceived risk associated with marijuana use has been declining during the late 1990s and 2000s. Survey results from 2011 indicate that most adolescents (57% of 8th graders, 70% of 10th graders, and 60% of 12th graders) do not view occasional marijuana use as a great risk (Johnston et al., 2012). Studies suggest that adolescents who believe a particular substance involves low levels of risk of harm and/or who approve of its use are more likely to use that substance (Cleveland, Feinberg, Bontempo, & Greenberg, 2008). The recent declines in perceived risk are indicative of recent shifts in American community norms that are more tolerant of marijuana use (Freise & Grube, 2013). Between 1996 and September 2013, twenty U.S. states and the District of Columbia have enacted laws making medical marijuana legal for adults. Approximately 70% of adults in the United States favor laws making it legal for doctors to prescribe marijuana to reduce pain and suffering (Gallup, 2011). Voters have also recently approved ballot measures to legalize recreational marijuana use among adults in Colorado and Washington State. Although these policies have received broad public support, there is some concern that these changes could lead to increases in access to marijuana and increases in the likelihood and frequency of marijuana use among children and adolescents (Freise & Grube, 2013).

Few studies have examined the public’s perceptions of, and response to, marijuana use in adolescents. Previous research on the attitudes toward adolescent marijuana use has focused on the views of adolescents (e.g., Cleveland et al., 2008; Johnston et al., 2012) and parents/caregivers (e.g., Fisher et al., 2006; Winters, Anderson, Bengston, Stinchfield, & Latimer, 2000). Little is known about the general public’s knowledge, beliefs, and attitudes toward adolescent marijuana use and related problems. While the recent opinion polls (e.g., Gallup, 2011) and referenda indicate some leniency toward marijuana (Freise & Grube, 2013), there are at this time few accompanying indicators of a strong commitment to prevention of use among the adolescent population.

Adolescents rarely enter into substance-abuse treatment independently (Godley & White, 2005). Consequently, their substance-abuse prevention and treatment needs must be understood in the context of familial, social, and cultural expectations. Until service providers understand the public’s ideas and expectations, they cannot adequately anticipate barriers to treatment that need to be surmounted before adolescents can benefit. Furthermore, even when adolescents do enter into treatment, treatment goals will likely be derailed if parental and community beliefs counter treatment recommendations (Taylor, 2010).

The purpose of the current study is to use a person-centered approach to examine patterns in the public perception and attitude toward marijuana use among adolescents. Person centered-models (e.g., latent class analysis [LCA], mixture modeling, growth mixture models, cluster analysis) highlight the heterogeneity within data and can help to identify groups of individuals who share similar attributes or relationships among attributes (Laursen & Hoff, 2006). This approach contrasts the more dominant variable-centered research paradigm which describes associations between variables rather than individuals. LCA is a form of person-centered analysis that has been widely used in the substance-use field (e.g., B. O. Muthén & Muthén, 2000; O’Connor & Colder, 2005). Classes of distinct subgroups are identified based on similar response patterns for a set of indicator variables (McCutcheon, 1987). For the present study, we use LCA to characterize patterns based on whether adults in Michigan (a) recognize adolescent marijuana use as a problem, (b) view treatment to be effective for adolescent marijuana use, (c) view help-seeking with mental health professionals to be an appropriate strategy for addressing adolescent marijuana use, and (d) whether they support prevention services for adolescents. After identifying these classes that share similar configurations of their public perception of adolescent marijuana use, we explore whether demographic characteristics (e.g., age, race/ethnicity, being a parent), personal experiences with alcohol and drugs, and methodological factors (e.g., type of survey) are associated with different class memberships. Based on previous studies that found an individual’s own use of substances contributes to their broader opinions of substance use (Hilton & Kaskutas, 1991; Latimer, Harwood, Newcomb, & Wagenaar, 2001; Wagenaar, Harwood, Toomey, Denl, & Zander, 2000), we hypothesize that each participant’s personal experience with alcohol and other substances will influence his or her opinions on adolescent marijuana use. Building on earlier substance-use studies (e.g., Pukstas, 2006), we also anticipate that parental status and other demographic variables (e.g., age, race/ethnicity, and gender) would influence participants’ attitudes and beliefs related to adolescent marijuana use.
Method

Survey Sample and Procedures

We used computer-assisted telephone interviewing (CATI) to collect data from a statewide sample of adults in Michigan. Michigan provides a useful context for this particular study, given that its voters approved the use of medical marijuana for adults in a 2008 statewide ballot measure by a substantial margin. Random-digit dialing was used to identify a sample of 4,445 active telephone numbers. Surveys were conducted with households where a person 18 or above agreed to participate. To ensure an adequate sample size and inclusion of individuals with only wireless telephone service or with no phone service at all (Galesic, Tourangeau, & Couper, 2006), the telephone survey was supplemented with paper- and web-based surveys for nonrespondents. With the assistance of a directory information service provider, we were able to append addresses to about half of the active telephone numbers (2,198 out of 4,445). After 1 month of telephone attempts, paper copies of the surveys were sent to all nonrespondents for which we had a mailing address (n = 1,720).

The mailed packet also included information on how to access the survey online, including the web address and a log-in ID and password. Individuals who indicated they did not have time to complete the survey over the telephone were also provided with the web address to complete the survey online or were offered the survey by mail. Participants were offered a US$5 gift card for their participation.

After 2 months of telephone interviewing and the mailing to survey nonrespondents, data collection ceased. The total number of unduplicated completed surveys was 624. During the calling process, 1,164 of the 4,445 telephone numbers were removed from the survey sample due to known ineligibility (having dispositions such as disconnected number, business number, fax/modem, unqualified resident). Using guidelines from the American Association for Public Opinion Research (AAPOR, 2011), we calculated the response rate, margin of error and response rate.4 A response rate of 25.8% was obtained for the statewide survey and the margin of error was ±3.8 percentage points. The cooperation rate was 58.3%.

For the current study, 64 participants were excluded from analyses due to nonresponse on all of the vignette questions. This results in an analytic sample size of n = 560.

Measures

For the current study, we adapted a vignette technique that has been used in public opinion research on mental illness (Pescosolido et al., 2008). Two vignettes describing marijuana use among 16-year-old adolescents were developed. By focusing on this age, we were able to ensure participants would be older than the adolescents described in the vignettes. We also felt there may be greater variability in the attitudes toward marijuana use among 16-year-olds compared with younger adolescents (e.g., 13-year-olds). These vignettes featured varying contexts, levels of marijuana use, and problems associated with use.

After each of the vignettes, participants were asked as series of questions in response to the situation that was described (see the appendix for the vignettes and additional survey items). These questions addressed perception of problem severity, belief in treatment efficacy, and attitude toward help-seeking with a professional. The first question measured the perception of problem severity by asking: “How serious would you consider this teen’s problem, if any, to be?” (very serious, somewhat serious, not very serious, or not at all serious). The next question addressed the belief in treatment efficacy and asked, “How likely do you think it is that would this situation improve with treatment?” (very likely, somewhat likely, somewhat unlikely, very unlikely). The third question addressed help-seeking behaviors: “If this child were your own, how likely is it that you would seek help from a doctor, nurse, counselor, psychologist, social worker, or other mental health professional?” (very likely, somewhat likely, somewhat unlikely, or very unlikely). Responses on these three questions were dichotomized to create indicator variables for the LCA. Responses for the problem severity question were coded as 1 for serious (combining very serious and somewhat serious) and 0 for not serious (combining not very serious and not at all serious). The other items were coded 1 for likely (combining very likely and somewhat likely) and 0 for unlikely (combining somewhat unlikely and very unlikely). One additional question from previous public opinion research (Pukstas, 2006) asked participants about their general support for marijuana prevention efforts. This item evaluated the level of agreement with the statement, “It is possible to reduce marijuana problems through prevention” (strongly agree, somewhat agree, or somewhat disagree or strongly disagree). Responses for this question were also coded as 1 for likely (combining very likely and somewhat likely) and 0 for unlikely (combining somewhat unlikely and very unlikely). These seven questions (six questions based on the vignettes and the one question addressing marijuana prevention more generally) were combined and used as the indicator variables for the LCA.

Additional survey items were included as independent and control variables. These included the participant’s demographic/background characteristics, substance use, and the data collection strategy (see the appendix for specific survey items). Demographic measures included age (in years), gender (male or female), and marital status (coded as married and cohabitating vs. not married). Highest level of educational attainment was measured and responses were coded into two groups (1 for those with bachelor’s degree or higher and 0 for those with less than a bachelor’s degree). Parental status was measured with two items assessing whether participants have children (including adult children) and whether they have children are below age 18 in their household. Two questions from the Addiction Severity Index (McLellan et al., 2002) were included to ask about recent experiences
with alcohol or marijuana. These items asked “How many days in the past month have you used alcohol?” and “How many days in the past month have you used marijuana?” An additional item from the National Survey on Drug Use and Health (SAMHSA, 2012) was adapted to measure lifetime experiences with drugs other than marijuana. This question asked: In your lifetime, have you ever tried other illicit drugs (other than marijuana), like cocaine or crack or heroin, or any other substance not prescribed by a doctor, to get high or to achieve an altered state? Two final items were used to assess the impact of the recruitment strategy. These items examined the extent of landline telephone usage (less than 1/3 of telephone calls on a landline coded as 1 and 1/3 or greater coded as 0) and survey mode (CATI, web, or paper).

Analytic Strategy

LCA is a form of person-centered analysis and is used to identify different and distinct patterns within the broader population, based on the similarity of responses to the adolescent marijuana use variables (e.g., problem recognition, and treatment efficacy). This approach may facilitate the identification of particular subgroups within the population that vary in the extent to which they view adolescent substance abuse as a problem and the extent to which they support substance-abuse treatment for problems related to adolescent marijuana use. We compared a series of latent class models to determine the optimal model in terms of balancing model fit and parsimony. Multiple indicators were examined to assess model fit, including the Bayesian Information Criterion (BIC; Schwarz, 1978), entropy and average latent class posterior probabilities, the number and percentage of participants in the smallest class, and interpretability of results.

The BIC (Sclove, 1987) is considered to be one of the more reliable indicators of model fit in LCA (Nyulund, Asparouhov, & Muthén, 2007; Tofghi & Enders, 2007). Lower BIC values indicate better model fit. BIC can be used to assess relative fit when comparing models with various numbers of classes (e.g., two classes vs. three classes). Posterior probabilities provide another criterion to assess model fit in LCA. Rather than assigning each individual participant to a specific class (as is done in cluster analysis), in LCA each participant is assigned a probability value for membership in each class. These probabilities are a function of each individual’s response patterns, the number of latent classes, and the proportion of individuals estimated to be in each class (Roesch, Villodas, & Villodas, 2010). In a well-fitting model, each participant will have a high probability of membership in one class and low probability of membership in all other classes. Entropy provides an aggregate measure of the posterior probabilities and is an indicator of how well classes can be distinguished. Entropy values above 0.8 are considered acceptable (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993; Weden & Zabin, 2005). Class size should also be taken into consideration when comparing latent class models. Classes with less than 5% of the sample in the smallest group are generally discouraged unless smaller groups are expected, based on theory or epidemiology (Weller, Bowen, & Bowen, 2013). The final and perhaps most important model selection criteria are substantive meaning and interpretability (B. O. Muthén & Muthén, 2000; O’Connor & Colder, 2005). According to numerous LCA experts, substantive meaning and interpretability are critical considerations that can sometimes supersede statistical criteria for selection of the final latent class model (B. O. Muthén & Muthén, 2000; O’Connor & Colder, 2005; Weller et al., 2013).

Once the final latent class model was identified, we conducted multinomial logistic regression to investigate the relationship between class membership and demographic characteristics, substance use, and the data collection strategy. Race/ethnicity, initially classified into five categories in descriptive analysis (i.e., non-Hispanic White, African American, Hispanic, Asian American, and Other) was converted into dichotomous variables (i.e., White and non-White) for multinomial logistic regression because of small sample sizes in several groups. Data were weighted using sampling weights that adjust for oversampling based on age, gender and race/ethnicity. Latent class models were conducted in Mplus version 6.12 (L. K. Muthén & Muthén, 1998-2010) and the multinomial logistic regression was conducted in Stat version 12 (StataCorp, 2011).

Results

Descriptive Statistics

Survey participants (n = 560) ranged in age from 18 to 95, with an average age of 49 years (SD = 16.3). Half of the participants (49%) were female, and more than half (60%) were married or cohabiting. Most of the participants (77%) self-identified their primary racial or ethnic origin as white/Caucasian, while a smaller proportion of participants identified themselves as Black/African American (13%), Latino/Hispanic, American Indian, Asian/Pacific Islander, or Arab/Middle Eastern (less than 3% for each of these groups). While the majority of participants (79%) reported having children, only 39% had children under the age of 18. Regarding educational level, 58% had earned a high school diploma/GED or less, while 42% of participants had completed a college degree (26% had completed a bachelor’s degree and 16% had completed a graduate or professional degree). More than half the sample (54%) reported recent (past 30 day) alcohol use, while only 6% reported recent (past 30 day) marijuana use. Almost a quarter of participants in the sample (22%) reported that they have used nonmedical prescription drugs or illicit drugs other than marijuana in their lifetimes.

Most participants (74%) completed the survey through the CATI, while smaller numbers completed the web (2%) or...
We determined that the three class model provided a more optimal solution, compared with one-, two-, three-, four-class models. The three class model exhibited the best empirical fit (BIC = 4,219; entropy = 0.95, posterior probabilities ≥ .95) and had a clearly distinguishable set of classes that were conceptually plausible. Figure 1 presents the adolescent marijuana use ratings for each class. The seven marijuana indicator variables are along the x-axis and the probabilities of class membership are plotted along the y-axis. The probability of class membership represents the average probability that members in a class reported high scores (indicator variable = 1) on each item. The distinguishing features of each class were used in selecting names for each class. The first class had moderate probabilities for problem recognition and help-seeking for the first vignette (Class 1: “discriminating class” 26.7%). This class had higher probabilities of problem recognition and help-seeking for the second vignette, which involved more problems (e.g., problems at school, marijuana possession arrest). The second class had low probabilities of problem recognition and help-seeking behaviors for both vignettes (Class 2: “low concern” 7.0%). The final and largest class, had high probabilities of problem recognition and help-seeking across the two scenarios (Class 3: “high concern” 66.4%).

**Multinomial Logistic Regression**

To learn more about patterns related to the public perceptions of adolescent marijuana use, we looked at demographic characteristics (e.g., age, race/ethnicity, being a parent), alcohol and drug use, and methodological factors (e.g., type of survey) for each of the public perception latent classes, using multinomial logistic regression analysis. The multinomial logistic regression model was estimated by entering all variables simultaneously. Each latent class is compared with the high-concern reference group (Class 3). Table 1 describes the relationships between the public perception classes and the study variables. When comparing the discriminating group (Class 1) to the high-concern group (Class 3), there were several notable differences. The discriminating group (Class 1) was significantly younger than the high-concern group (Class 3). Other demographic variables (i.e., gender, race, education, marital status, and parental status) were not significantly different between the discriminating and high-concern public perception groups. The variables indicating substance use of the respondent were among the strongest determinants of group membership. Adults in the discriminating group (Class 1) were more likely than the high-concern group (Class 3) to report alcohol or marijuana use in the past 30 days (alcohol odds ratio [OR] = 1.72; confidence interval [CI] = [1.03, 2.87]; marijuana OR = 3.82 CI = [1.24, 11.80]). Those participants in the discriminating group (Class 1) who had more problems (e.g., problems at school, marijuana possession arrest) were more likely than the high-concern group to report use of drugs other than marijuana (lifetime; OR = 2.24 CI = [1.27, 3.95]). When comparing the low-concern group (Class 2) to the high-concern group (Class 3), there were no discernible differences.

**Discussion**

The health, psychosocial, and legal consequences associated with marijuana use can be serious and the results of this study suggest that most adults have concerns about marijuana use among adolescents. The largest group of participants (Class 3 “high-concern group” n = 476) recognized both situations in the vignettes as potential problems. The second largest group of adults (Class 1 “discriminating group” n = 173) ascribed different levels of problem severity to the hypothetical situations. These adults appeared to have fewer concerns with marijuana use that occurred in a social
context and was not associated with other problems. Adults in this discriminating class (Class 1) were more concerned by the vignette that involved marijuana use in multiple contexts (e.g., social settings and alone) and several problems related or potentially related to marijuana use (e.g., falling grades, school suspension, and marijuana possession arrest). This finding may reflect the attitude that experimentation with marijuana during adolescence or young adulthood does not necessarily indicate a very serious problem. For many adolescents, marijuana use is developmentally limited and does not lead to substance-use problems later in life (Schulenberg et al., 2005). It also may reflect the popular perception that marijuana is not considered an “addictive” drug.

Participants in Classes 1 (discriminating group) and 3 (high-concern group) reported stronger beliefs in treatment effectiveness, particularly in reacting to the second vignette. These groups also showed higher levels of support for help-seeking and indicated greater willingness to seek professional help if the adolescents described were their own children. It is possible that this willingness may be overstated. Previous research using vignettes and hypothetical situations (Hughes & Huby, 2004; Pescosolido et al., 2008) has shown that willingness to seek help is likely to be lower when faced with a similar situation in real life. Regardless, these results provide insight into how the general public assesses risk and views treatment for marijuana use among adolescents.

Results indicate that individuals in the discriminating group (Class 1) were significantly younger and reported higher rates of current substance use, compared with the high-concern group (Class 3). The finding that the discriminating group was significantly younger is consistent with public opinion research that has demonstrated some differences in attitudes toward marijuana along age lines. Analysis of the General Social Survey, for example, suggests that the Silent Generation (those born between 1925 and 1945) is the age cohort least likely to favor marijuana legalization in the United States (Caulkins, Coulson, Farber, & Vesely, 2012). The findings of the current study suggest that one’s personal experiences with alcohol and drugs may also be important factors in shaping individual dispositions to consider a situation problematic and urge treatment. Sherman, Nelson, and Steele (2000) suggested that individuals often interpret situations involving health risks in such a way that they can preserve a positive self-image. It is therefore not surprising that many marijuana users do not see their use as particularly risky or problematic (Kilmer, Hunt, Lee, & Neighbors, 2007). The current study further suggests that these types of assessments may also hold true when assessing the risks for adolescent marijuana use.

Although most participants (93%) expressed some concern related to the vignettes involving adolescent marijuana use, a small group did not consider either of the situations in the vignettes to be problematic or situations where they would seek treatment if the teens were their own children (Class 2; n = 52). In terms of their demographic background and substance-use characteristics, the low-concern group (Class 2) was fairly similar to the high-concern group (Class 3) that identified both vignettes as hypothesizing serious problems. Although these groups are similar with regard to recent alcohol and marijuana use, it is unclear whether these
groups also have similar previous experiences with alcohol, marijuana and other drugs (e.g., past-year or lifetime). Other studies have suggested that individual past experiences using marijuana are an important determinant in the perceived risk associated with marijuana use (Kilmer et al., 2007) and the attitude toward marijuana policies (Williams, van Ours, & Grossman, 2011). In a sample of college students, Kilmer and colleagues (2007) found that the perceived risk associated with marijuana use was greater among nonusers of marijuana than among those who did. Williams et al. (2011) similarly found in the Australian Drug Strategy’s National Household Survey that both current marijuana use and past use were significantly associated with supporting marijuana legalization. Future research on public attitudes toward adolescent marijuana use should explore whether there are any differences in past substance use and substance-use related consequences over the life span and if these factors are likely to impact group membership.

**Limitations and Future Research**

Results of this research should be viewed in the context of its limitations. Due to the low response rate, generalizability may be limited. The CATI helped us to achieve a relatively high level of coverage of the state population and ensured privacy and accuracy of reports of sensitive information (Galesic et al., 2006). However, its use may have also resulted in some bias. Sampling for this multimethod survey was conducted using random-digit dialing and may underrepresent those individuals who do not have a telephone or who only have mobile phones. Although 20.0% of our sample reported that they receive all of their phone calls on a mobile telephone, this number is likely to be lower than the rate of wireless-only households in Michigan. Estimates from the National Health Interview Survey, for example, suggest that, during the period which this study was conducted, 29.2% of households in Michigan were wireless only (Blumberg et al., 2011). Previous research on telephone surveys has also indicated that demographic factors such as income and employment are significantly related to participation (Johnson, Holbrook, Cho, & Bossarte, 2006). It is possible that these factors are also related to variables in this study. Finally, it is also worth noting that the assessments were limited in scope and focused on just the two situations described in the vignettes. Future studies would benefit from using a broader range of situations that include more varied levels of substance use, use of other substances and more varied characteristics of the adolescents (e.g., gender, age, race) as well as more detailed measures (e.g., lifetime substance-use experiences). The current study reflects only on the public attitude toward 16-year-old adolescents and does not reflect attitude toward older or younger adolescents. Additional research on other ages and research using other samples are also needed to establish stronger confidence in the classes derived from the current data (Bauer, 2007; Roesch et al., 2010). The current application of LCA is a good first step toward this end.

**Conclusion**

The current study used a vignette technique to examine the attitudes and beliefs held by the general public about adolescent marijuana use. Marijuana has generally been perceived as being associated with a lower level of risk, and both adolescents and adults may be less likely to perceive a need to treat adolescent marijuana problems. Understanding the public’s views is important as the number of state-level policies providing adults access to marijuana for medical and recreational purposes increases. Public opinion can help to shape what individuals consider to be a problem and what advice is given to adolescents and caregivers of adolescents facing problems related to marijuana. The attitudes and beliefs of the general public have been noticeably absent from the research literature. The present study offers insight into how the general public responds to marijuana use and related problems among adolescents. This research represents only a first step in understanding these cultural attitudes, and future investigation is needed to examine other factors related to adolescent marijuana use and treatment. A joint understanding of the larger cultural context, coupled with a greater public awareness of effective treatment opportunities may offer a pathway to improved outcomes for adolescents.
Appendix

Survey Items and Vignettes.

1. How many children or teenagers under the age of 18 currently live in your household, if any?
2. How many children, including adult children, do you have living in your household, if any?
3. What is your current marital status?
   - Married
   - Separated
   - Never married
   - Widowed
   - Divorced
   - Cohabiting with a partner
4. Please indicate your gender:
   - Female
   - Male
5. Thinking about ALL of the phone calls that you’ve received on your landline and on your cell phone, what percent (from 0 to 100) do you receive on a LANDLINE?
6. In what year were you born?
7. What was your age at your last birthday?
8. What is your PRIMARY race or ethnic origin?
   - White/Caucasian
   - Black/African American
   - Latino/Hispanic
   - American Indian/Aleut/Eskimo
   - Asian/Pacific Islander
   - Arab/Middle Eastern
   - Other
   Other (Specify):
9. What is the highest degree or accreditation you have received?
   - None (did not graduate high school)
   - High school graduate with diploma or GED
   - Apprenticeship certificate (craft/trade/professional certificate)
   - Associates degree in college (occupational/vocational program)
   - Bachelor’s degree (BA, AB, BS, etc.)
   - Master’s degree (MA, MS, MSW, MBA, etc.)
   - Professional school degree (MD, DDS, JD, etc.)
   - Associates degree in college (academic program)
   - Doctorate (PhD, ED, etc.)
   Other (Specify):
10. People have different attitudes about substance abuse. The questions in the next section will help us learn more about the attitudes and beliefs people in Michigan have about marijuana use among adolescents.

11. Jamie is a 16-year old female. She has a large group of friends. Jamie started smoking marijuana about 6 months ago. Jamie smokes marijuana about 3 or 4 times each month, typically with her friends after school or at parties.
   a. How serious would you consider this teen’s problem, if any, to be?
      - Very serious
      - Somewhat serious
      - Not very serious
      - Not at all serious
   b. How likely do you think it is that this situation would improve with treatment?
      - Very likely
      - Somewhat likely
      - Somewhat unlikely
      - Very unlikely
   c. If this child were your own, how likely is it that you would seek help from a doctor, nurse, counselor, psychologist, social worker, or other health care professional?
      - Very likely
      - Somewhat likely
      - Somewhat unlikely
      - Very unlikely

12. Mike is a 16-year-old male. He has generally been a good student in school, but his grades have fallen recently. He spends his time in his room or with a few friends “down the street.” He smokes marijuana almost daily, often with friends, but sometimes alone. Mike has had several issues at school, including a suspension. He has recently been arrested for Marijuana Possession.
   a. How serious would you consider this teen’s problem, if any, to be?
      - Very serious
      - Somewhat serious
      - Not very serious
      - Not at all serious
   b. How likely do you think this problem would improve on its own if left alone?
      - Very likely
      - Somewhat likely
      - Somewhat unlikely
      - Very unlikely
   c. How likely do you think this problem would improve with treatment?
      - Very likely
      - Somewhat likely
      - Somewhat unlikely
      - Very unlikely
   d. If this child were your own, how likely is it that you would seek help from a doctor, nurse, counselor, psychologist, social worker, or other health care professional?
      - Very likely
      - Somewhat likely
      - Somewhat unlikely
      - Very unlikely

How much do you agree or disagree with the following statements?

13. It is possible to reduce marijuana problems through prevention.
   - Strongly agree
   - Somewhat agree
   - Somewhat disagree
   - Strongly disagree

The next few items will ask you some general questions about alcohol, marijuana, and other drugs. Remember that these questions are confidential; there is no way you could be identified by your response.

14. How many days in the last month have you used alcohol?
15. How many days in the last month have you used marijuana?
16. In your lifetime, have you ever tried other illicit drugs (not including marijuana, like cocaine, crack, heroin, or any other substance not prescribed by a doctor?)
   - Yes
   - No
Author’s Note
The views expressed herein represent the views of the author. The Center for Urban Studies bears no responsibility for the analysis or interpretation(s) of the data presented.

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Notes
1. Although specific definitions of adolescence vary, it is commonly understood to define the transitional period between childhood and adulthood (Kaplan, 2004).
2. These states include Alaska, Arizona, California, Colorado, Connecticut, District of Columbia, Delaware, Hawaii, Illinois, Maine, Massachusetts, Michigan, Montana, Nevada, New Hampshire, New Jersey, New Mexico, Oregon, Rhode Island, Vermont, and Washington.
3. For detailed discussions of person-centered approaches see Bergman, Magnusson, and El-Khouri (2003); Bergman, von Eye, and Magnusson (2006); and Laursen and Hoff (2006).
4. The response rate formula takes into account the percentage of the sample with known eligibility and unknown eligibility (e.g., busy signal, no answer; The American Association for Public Opinion Research [AAPOR], 2011; response rate method 4). The cooperation rate is the number of complete interviews divided by the number of interviews plus the number of noninterviews that involve the identification of and contact with an eligible respondent (AAPOR, 2011; cooperation rate 2).
5. Weighted percentages are provided for categorical variables, while weighted means and standard deviations are provided for continuous variables.

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