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Adults' Perceptions of Medical Cannabis Use by Children and Adolescents

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Abstract

Adults' Perceptions of Medicinal Cannabis Use by Teens and Children

By Anna Levenson Butler

Many American states have recently legalized medical cannabis. In some states, medical cannabis can be prescribed to minors. Thus, this investigation aimed to evaluate public perceptions of medical cannabis use by children and adolescents. A survey was developed and distributed to psychology graduate and undergraduate students at a large national university. Respondents represented many ethnic groups and a wide age range; all had received at least some university education and most, 87%, were women. Subjects' perceptions of cannabis use in general, and medical cannabis use, were largely positive. Although mean favorability toward childhood medical cannabis use was positive, favorability toward childhood medical cannabis was significantly lower than toward adult medical cannabis use. Surprisingly, this difference was unrelated to subjects' sociodemographic characteristics. Yet nearly every survey question about cannabis in general, child cannabis, and associated medical issues was found to be significantly related to subject's favorability ratings toward childhood medical cannabis use. This very clear and consistent finding suggests that there may be a fundamental difference in opinion toward adult vs. childhood medical cannabis use, regardless of age, gender, education, ethnicity, or general attitudes toward cannabis. This difference may relate to parental protectiveness toward children, a tendency to want a more abundant factual basis and scientific consensus before exposing children to any form of medication, or simply lack of knowledge and familiarity with childhood medical cannabis use.

Keywords: cannabis, marijuana, children, adolescents, perception

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Some scientific evidence supports the efficacy of medical cannabis treatment for several disorders or illnesses that affect children and adolescents, including seizures, ADHD, symptoms of cancer and side effects of cancer treatment, and certain types of severe pain (Jaffe & Klein, 2010). Some studies suggest that medical cannabis treatment may entail fewer side effects than other medications prescribed for these problems (Grant et al., 2012), particularly the stimulant medications typically used to treat ADHD, which have multiple side effects and long-term complications (Berman, 2012). In keeping with this evidence, some states in the US have passed medical cannabis legislation which permits a physician to prescribe medical cannabis to minors. These states include Alaska, Arizona, Connecticut, Delaware, Hawaii, Maine, Massachusetts, Michigan, Montana, Nevada, New Jersey, New Mexico, Oregon, Vermont, Washington, and Rhode Island, along with the District of Columbia (National Conference of State Legislatures, 2013). Nevertheless, cannabis remains the primary illicit drug used by minors in the US (National Institute on Drug Abuse, 2010). In 2009, for example, one study reported that 12 percent of 8th graders, 27 percent of 10th graders, and 33% of 12th graders had used cannabis in the past year. The Drug Abuse Warning Network (DAWN, 2012), a system for monitoring the health impact of drugs, estimated that in 2008 cannabis was a contributing factor in over 374,000 emergency department visits in the US, with about two-thirds of patients being male, and 13 percent between the ages of 12 and 17; 13% of 12-17 year old adolescents represents 43,000 emergency room visits related in some manner to cannabis use--a very large number. In addition, there are various reports in the peer-reviewed literature suggesting that cannabis use in teenagers is associated with a range of difficulties, including but not limited to poorer psychomotor speed, lower sustained attention, and cognitive inhibition, especially among young men (Lisdahl & Price, 2012), as well as decreased executive function (Samson, 2010); perpetration of and

victimization by intimate partner violence in early adulthood (Fergusson & Boden, 2008; Green & Ensminger, 2006; Reingle, Staras, Jennings, Branchini, & Maldonado-Molina, 2012); development of psychosis in early adulthood (Bhattacharyya, 2012; Fiorentini, Volonteri, Dragogna, Rovera, Maffini, Mauri, & Altamura, 2011; Gastel, Wigman, Monshouwer, Kahn, van Os, Boks, & Vollebergh, 2012); increased risk of antisocial behavior in adulthood (Brook, Zhang, & Brook, 2011; Fergusson, Lynskey, & Horwood, 1996; Flory, Lynam, Milich, Leukefeld, & Clayton, 2004; Tucker, Ellickson, Orlando, Martino, & Klein, 2005); increased risk of psychological disorders (Arseneault, Cannon, Witton, & Murray, 2004; Fergusson, Lynskey, & Horwood, 1996; Patton, Coffey, Carlin, Degenhardt, Lynskey, & Hall, 2002); lower completed education (Ellickson, Martino, & Collins, 2004; Fergusson, Lynskey, & Horwood, 1996; Tucker, Ellickson, Orlando, Martino, & Klein, 2005) and lower income (Brook, Lee, Brown, Finch, & Brook, 2011; Ellickson, Martino, & Collins, 2004). Many of these studies have been criticized on methodological grounds, and many demonstrate associations rather than causality. As such, there remains a robust debate in the field about the effects of cannabis use on children and teenagers.

Public opinion regarding medical cannabis has shifted rapidly in the past 10 years, with a majority of Americans now supporting legal and available medical cannabis (Bostwick, 2012). As of this writing, 19 of the 50 US states have legalized medical cannabis (National Conference of State Legislatures, 2013). Also, in late 2010, two states, Washington and Colorado, made landmark decisions to legalize cannabis, even for recreational use. In this context, it would be important to understand whether adults view the use of medical cannabis treatment differently if the patient is a minor vs. an adult. The results of such a survey would have implications for public policy, public education, and future research.

According to Bostwick (2012), a medical researcher affiliated with the Mayo Clinic, human beings have used *Cannabis sativa* for five millennia, as folk medicine, for spiritual reasons, and recreationally. It was first used medically in Central Asia and then spread throughout China and India. Between 2000 and 1400 B.C., it traveled to Egypt, Persia, and further west to Greece and Rome, where the plant was used both for its hemp textile value and medical applications. Western medicine became aware of cannabis' possible medical value in the 1830s, when W.B. O'Shaughnessy, an Irish physician, found cannabis in Calcutta. The list of indications he gave for recommending cannabis included pain, vomiting, convulsions, and spasticity: a list bearing resemblance to the roster of purported cannabis treatments today. In the 19th century, western physicians added insomnia, headaches, anorexia, and sexual dysfunction to this list of ailments observed clinically to be alleviated by marijuana use.

Important to understanding the effects of medical cannabis is knowledge of the human endocannabinoid system. Even with the long history of medical use, however, practically nothing was known about cannabis' mechanism of action until approximately 50 years ago. In 1964, the structure of delta-9-tetrahydrocannabinol (THC), which is the main medically active ingredient in cannabis, was isolated (Bostwick, 2012). Yet the CB1 receptor was not located until 1990, and not until 1992 was it discovered that THC was in fact binding to the CB1 receptor. In the following years, a CB2 cannabinoid receptor has been identified and the different functions of the receptors further elucidated. Now it is known that the endocannabinoid system acts throughout the body as a "physiologic modulator not only of the central nervous system but also of the autonomic nervous system, immune system, gastrointestinal tract, reproductive system, cardiovascular system, and endocrine network" (Bostwick, 2012, p. 178). Specifically, CB1 receptors are found in the central nervous system and are heavily distributed throughout the

intestinal tract. CB2 receptors are generally found only in the periphery, where their activity is fundamental to responses related to cell inflammation and pain as well as to gastrointestinal functioning and digestion. A near absence of CB1 receptors in the brainstem has been suggested as a reason why overdoses via cannabis have been rarely reported, because cannabis does not appear to affect essential life functions.

Cannabis Among Adolescents

Medical cannabis was first studied in a sample of adolescents in 2006 (DeLisi, Bertisch, Szulc, Majcher, Brown, Bappal, & Ardenkani). DeLisi et al. (2006) found no structural brain changes associated with adolescent cannabis use. This study is important because the adolescent brain is still developing and it would be of concern if any medication appreciably altered brain structure during brain development. DeLisi et al. (2006) discussed an early study from the 1970s which concluded that cannabis caused cerebral atrophy. This study was followed by studies in the 1970s and 1980s which refuted these finding. According to DeLisi, "Most recently, there were two MRI studies which showed no difference in grey or white matter volumes, cerebrospinal fluid, or hippocampus volumes when comparing heavy cannabis users with non-users (2006, p. 1)." However, an article recently published in Australia describes erosion of the physical hippocampus and amygdala by means of fMRI studies on a group of chronic cannabis users (Yucel, Solowij, Respondek, Whittle, Fornito, Pantelis, Lubman, 2008). Similar memory losses have been observed clinically in an outpatient setting in the US and confirmed in a few cases by administration of the Repeatable Battery and Assessment Neuropsychological Status on a longitudinal basis (J. Burke, personal communication, December 12, 2012). As such, from the mixed evidence, it is unclear if cannabis use alters brain structure in developing adolescents.

DeLisi et al. (2006) also consider the issue of cannabis and neurotoxicity. Reviewing the relatively few studies on this topic and even fewer studies conducted specifically on adolescents or children, they conclude that there is no evidence that cannabis is neurotoxic. Nevertheless, this concern cannot be considered settled. DeLisi et al. (2006) supplement their tentative conclusion with their own investigation. They utilized a sample of young adults, ages 17 to 30, recruited from a volunteer pool at The Nathan S. Kline Institute for Psychiatric Research and by direct advertisement in local communities surrounding the institute. Participants were not recruited based on a history of cannabis use and the advertisements did not mention cannabis. Potential participants were screened and cannabis users were admitted to the study if cannabis use began prior to 18 and if they used cannabis more than 21 times in a single year. Control subjects were admitted to the study if they had no illegal substance use, no frequent alcohol use in the past or currently, and were not taking any medication for long periods of time. Control subjects were matched to cannabis users of requisite sex, age, and social class. There were nine males and one female in the final subject pool.

MRIs were performed on all participants. DeLisi et al. (2006) used diffusion tensor imaging (DTI) to examine white matter integrity to assess indicators of cortical atrophy and white matter abnormalities in the brain as a result of cannabis use. They found no indicators of pathological change at all. There was no evidence of atrophy. Admittedly, a limitation of this study is that it is quite small and relies on retrospective subject self-report, nor did it include individuals currently using cannabis. And another recent study appears to contradict these findings (Yucel, Solowij, Respondek, Whittle, Fornito, Pantelis, Lubman, 2008), leaving the question unanswered.

Padula, Schweinsburg, and Tapert (2007) summarized reports that 44% of 12th graders have used cannabis in their lifetime, up 16% from 8th grade. Although brain size stabilizes around age five, important developmental changes happen throughout childhood into adolescence, including myelination, synaptic refinement, and cognitive and functional elements. Padula et al. (2007, 479) reported that "studies suggest altered working memory functioning among adolescent cannabis users that may persist after a month of abstinence." Thus, Padula et al. (2007) studied spatial working memory using functional magnetic resonance imaging (fMRI) activation interactions in currently cannabis abstinent adolescents, both those who had previously used cannabis and those who had not. Due to high quality spatial resolution, fMRI is a useful method for visualizing neural activation. Padula et al. (2007) distributed flyers at local high schools, community colleges, and universities to recruit 16 to 18 year old adolescents. Potential participants were tested to ensure none had a mental disorder or substance use disorder. Other exclusion criteria were neurological disorder or dysfunction, head injury, physical health problems, learning disabilities, or MRI incompatibility.

Groups consisted of 17 heavy cannabis users and 17 non-users and were comparable in age, gender, ethnicity, IQ levels, and socioeconomic status. Spatial Working Memory (SWM) testing was performed for all 34 subjects, after the 17 cannabis users had abstained for 28 days. Results showed that cannabis using teens performed very similarly to controls in terms of spatial working memory (SWM). Furthermore, cannabis users showed considerably more activation than control groups in the right basal ganglia, an area typically associated with skill learning. Cannabis users were shown to use multiple memory modalities, suggesting their task performance was related to using more areas of the brain, such as verbal learning and IQ together. Padula et al. (2007) speculate that this may be due to cannabis users making a more

conscious decision to react to task cues than control subjects, to an adverse effect of cannabis use, or merely to a benign difference. They conclude that the difference noted is of little clinical consequence, because performance was not impaired and the observed difference does not suggest or correlate with any known brain abnormality. Yet an alternative interpretation is possible, such that the brain is being forced to use a greater number of neural networks and a larger area of the cortex to accomplish the same task that is normally conducted with a smaller amount of brain tissue. For example, this same pattern of using larger neural networks occurs during aging in human beings, because the brain is less efficient in persons over the age of 70 (Sternberg, 2008).

One recent paper (Meier et al., 2012) studied persistent cannabis use and found some evidence of neurological decline. This study followed over 1,000 subjects (N = 1,037) from birth to 38 years of age, doing interviews at ages 18, 21, 26, 32, and 38. Neuropsychological testing was done at 13 years, before initiating cannabis use, and again at 38 years of age, when cannabis use had become persistent. Meier et al. (2012) tested six hypotheses. First, they tested a cognitive decline hypothesis, in which they hypothesized that regular cannabis users would show greater decline from childhood to adulthood. Second, they tested a specificity hypothesis, in which they attempted to demonstrate whether or not impairment was confined to specific neuropsychological domains or was global. Third, they tested an education hypothesis, in which they suggested that regular cannabis users would experience neuropsychological decline because they were less likely to pursue further academics or other opportunities for learning. Fourth, they tested what they called the "everyday cognition" hypothesis, which tested how "cannabis induced neuropsychological impairment translates into functional problems in daily life" (Meier et al., 2012, 2). Fifth, they tested a developmental vulnerability hypothesis, in which they

suggested that those who began using cannabis as teenagers would be vulnerable to the effects of cannabis use on a developing brain. Finally, they tested a recovery hypothesis, which explored whether or not former cannabis users were able to restore their neuropsychological health.

The authors found preliminary evidence of mild IQ decline, most pronounced among the most persistent cannabis-dependence group (Meier et al., 2012). However, when attempting to determine if the impairment was specific to certain neuropsychological domains or global, the results suggested that the impairment was not statistically significantly different enough across neuropsychological domains to suggest real impairment of any sort whatsoever. They also found that fewer regular cannabis users pursued higher education after high school, and that these users experienced the greatest IQ decline. The IQ decline may be related to the lack of post-secondary education, rather than to the marijuana use itself, however.

The correlation between persistent cannabis use and less educational attainment is an association, not a causal statement. In other words, it is possible that some other factor(s) is responsible for both phenomena. For example, persons with fewer financial resources are less able to pursue higher education, and may also rely more on recreational drugs for entertainment because they are unable to afford other avenues.

Finally, Meier et al. (2012) found that adolescent onset users were more likely to become regular users. Because regular use was not clearly related to IQ decline and not causally established in relation to lower educational attainment, it remains unclear whether or not this finding has meaningful implications.

Finn (2012) shares statistics that approximately one third of all high school students have used cannabis in the past year and one out of sixteen 12th grade students use cannabis daily. Adolescent boys use cannabis more frequently than girls, 30% vs. 24% in 10th grade, and 37%

vs. 29% in 12th grade. Among the three largest racial/ethnic groups in the US, 10th grade Hispanic students use cannabis at 30%, Caucasians at 25%, and African-Americans at 22%. A reason given for the apparent resurgence in cannabis use among teenagers in recent years is that users and non-users alike are less likely to disapprove of cannabis. In 2010, 81% of students surveyed disapproved of cigarette smoking, but only 31% believed that smoking cannabis is detrimental.

Finn (2012) obtained participants from 11 public high schools, grades 9 through 12, a cross-section of the student body by race, gender, and grade level. There were 1,161 adolescents chosen, of whom 49% attended urban schools, 51% suburban; 48% were male, 52% female; 68% were Caucasian, 25% African-American, and 7% Hispanic. More than half of these students, 55%, lived with both parents, 12% with a parent and a step-parent, 27% in single-parent homes, and 6% had alternate living arrangements. About half the students, 53%, worked part time during the school year. Students were classified into three groups: nonusers, general users, and school users. Five indicators of student achievement were collected: (1) academic achievement, measured by self-reported grades from the students' last marking period; (2) classroom participation, evaluated by the Student Participation Questionnaire; (3) punishment, determined by frequency of detention and/or suspension during current school year; (4) nonattendance, measured by how often the student skipped class and/or school; and (5) cheating, assessed by frequency with which student self-reported cheating or submitted work not their own (Finn, 2012).

Finn (2012) found that in the preceding six months, 51% of participants had not used cannabis, 34% used cannabis generally, and 17% used cannabis at school. Of the students who used generally, 49% also used cannabis at school. Among all students, using the five indicators

of performance, Finn (2012) found that females performed better than males. Importantly, nonuser students performed better than general cannabis users, who performed better than the school users. However, Finn (2012) indicates that those students who use cannabis at school may have already been rebellious and lower achieving prior to cannabis use, since daily cannabis smoking is still part of America's counterculture. "Drug use at school may be more likely when students feel unsupported by their teachers, bored or unchallenged by schoolwork, and/or regard school rules as meaningless or unfair" (Finn, 2012, 11). As such, although her findings suggest the importance of further study, they do not allow for causal conclusions to be drawn because the study did not control for pre-cannabis student characteristics and performance.

Neighbors, Geisner, and Lee (2008) studied social norms and perceptions associated with cannabis use. Specifically, they considered the difference between descriptive norms, i.e., the perceived frequency of cannabis use by one's peers, and injunctive norms, i.e., the perceived approval of cannabis use by their peers. Neighbors et al. (2008) studied high school graduates who were enrolled in a public university for the upcoming year. The study included 2,123 students, ages 17 to 19, which completed a short survey in the summer prior to attending college. Neighbors et al. (2008) assessed demographics, risk taking behaviors such as cannabis and alcohol use, and psychological measures. This sample consisted of 55% females, 45% males; 76% Caucasian, 9% Asian-American, and 15% other ethnicities; with a mean age of 17.97 years.

The most common expectancies associated with smoking cannabis were behavioral effects such as relaxation, reduction of tension, social facilitation, perceptual enhancement, and verbal memory impairment. Furthermore, students who used cannabis associated more positive outcomes with cannabis than did non-cannabis using students. Only 17% of the students reported use of cannabis at the time of screening. The researchers found that students who had friends

who smoked cannabis were more accepting of cannabis use within their peer group. Alternately, "the negative association between injunctive norms and consequences, in the context of higher expectancies and descriptive norms, was an unanticipated finding" (Neighbors et al., 2008, 437). This means when use is more frequent, perceptions of cannabis use become more negative, especially for non-users.

Medical Cannabis and the Law

Ashton (2001) indicates that cannabis is an anxiolytic, sedative, analgesic, and psychedelic. It is an appetite stimulant and has systemic bodily effects. There are no deaths on record attributed to cannabis. Cannabis may produce a euphoric effect, commonly known as a *high*. It can also occasionally lead to feelings of paranoia and anxiety. Cannabis may produce perceptual changes such as brighter colors, more vivid emotions, more meaningful music perception, and altered time perception. With very high doses, hallucinations can occur. Short-term effects often include slowed reaction time, deficits in motor coordination, task and concentration impairment, and short-term memory deficits.

A significant obstacle to medical cannabis legalization pertains to deficits related to driving. Studies have shown that cannabis impairs driving performance and increases traffic accidents. However, since cannabis' retention in human cells varies widely from one person to another based on multiple physiological factors, there is no easy way to determine exactly how impaired someone's driving ability may be at different intervals following cannabis use. Among cannabis users who were involved in reported traffic accidents, "75% of a sample of drivers with cannabinoids in their blood were also intoxicated with alcohol" (Ashton, 2001, 105). Therefore, it is difficult to know based on existing data whether or not medical cannabis users will pose any greater risk to traffic safety than non-users. However, there is a synergistic effect between

cannabis and alcohol, such that drivers under the influence of both alcohol and cannabis simultaneously may be more dangerous on the road than alcohol-only impaired drivers (Fisher & Harrison, 2008).

According to Bostwick (2012), cannabis has a lifetime dependence risk of 9%, compared to 32% for nicotine, 23% for heroin, 17% for cocaine, and 15% for alcohol. However, some argue that cannabis is incapable of effecting a true addiction (Bostwick, 2012), while others argue that this perception is outdated due to the higher potency cannabis currently available, which may be capable of producing dependency within a few years (Grant et al., 2012). The traditional view of cannabis' lower risk of dependency is due to the virtual absence of the CB1 receptors in the brain stem, because of which cannabis completely spares the autonomic nervous system. The autonomic nervous system governs spontaneous respiration, heartbeats, and things of this nature. It is what tells our body to automatically keep going. Furthermore, tolerance and withdrawal have not been well documented among cannabis users, although tolerance and protracted withdrawal are now clinically seen among young as well as older cannabis users. Hence, potential abuse of cannabis among medical cannabis users is difficult to evaluate. Although some have even suggested that, other than a psychological dependency, physiological addiction does not occur, the World Health Organization has established criteria according to which cannabis is considered the most serious substance abuse problem worldwide. This divergence of perspectives suggests the extent to which the issues of cannabis abuse and dependence remain in dispute based on contradictory research findings and political considerations.

There are currently four pharmaceutical cannabinoids being marketed. Two of them are in the US, dronabiol and nabilone; one in Canada, nabiximol; and a fourth in Europe,

rimonabant. Rimonabant has shown promise in treating nicotine dependence and reducing appetite in obese persons. Although available in Europe since 2006, because of concerns with depression and suicidal behavior, the FDA has failed to approve its use in the United States. Dronabiol (Marinol®) is marketed for treating chemotherapy induced nausea, vomiting, and AIDS related wasting. Nabilone (Cesamet®) is marketed for very similar indications. Nabiximol (Sativex®) is a mouth spray with indications for cancer and neuropathic pain. Other pharmaceutical uses are likely given what is known about the history of cannabis use. Yet there are many barriers to medical cannabis research. In 1970, the US Congress declared cannabis to have no therapeutic value, and rendered the plant illegal. It was declared a Schedule I drug, along with cocaine and heroin, making it nearly impossible to grow or obtain for research or study purposes.

Despite its illegality at the federal level, nineteen US states and the District of Columbia have laws legalizing medical cannabis in direct contradiction to federal law (Bostwick, 2012), as well as complete recreational legalization in Colorado and Washington. As more states ignore the US Congress' classification and legalize medical cannabis, an emerging problem is that regulations lack consistency across states. For example, possession limits in Alaska allow patients to have one ounce and six plants of cannabis, but in Oregon 24 ounces and 24 plants. Furthermore, doctors who prescribe medical cannabis remain subject to the same federal prosecution as drug dealers, thus potentially suppressing their willingness to utilize medical cannabis for patients whose conditions may benefit from such treatment.

Grant, Atkinson, Gouaux, and Wilsey (2012) have presented arguments about medicinal cannabis' success is preventing pain. THC can be detected in plasma after the first puff of a cannabis cigarette, reaching peak concentrations after 10 minutes. This allows for easy dosage

self-titration. During a series of randomized clinical trials through the University of California Center for Medicinal Cannabis Research, many patients reported significant relief with cannabis cigarettes over placebo, up to a 50% improvement--which is an unusually large percentage of pain relief for a non-narcotic medication (Grant et al., 2012). Trials with dronabinol also "significantly outperformed placebo" (Grant et al., 2012).

Currently, the only method that allows for relatively precise dosage self-titration of cannabis is smoking. However, smoking is associated with negative perceptions from a long history of anti-tobacco advertisements. Smoking may also entail adverse side effects, although a recent study published in the prestigious *Journal of the American Medical Association* suggested that cannabis smoke causes no lung impairment and is in fact associated with mild improvements in lung air volume (Pletcher et al., 2012). Another study established a role for cannabis smoke in the development of chronic obstructive lung disease, but only if marijuana was smoked in conjunction with tobacco (Tan, Lo, Jong, Xing, Fitzgerald, Vollmer, Buist, & Sin, 2009). Yet a question remains about whether or not there may be an improved method for delivering this medication? One alternative is to vaporize the cannabis leaves, bypassing the possibility of carbon monoxide inhalation. Another alternative is sublingual delivery, as with Sativex®.

Another area of concern in legalizing medical cannabis is the fact that over the years the potency of cannabis has become stronger. In the past 15 years, the cannabis seized by the government has shown more than double the THC content, from 6% to between 9% and 25% (Grant et al., 2012). Clearly, attention needs to be paid to proper dosage and the strain of cannabis prescribed in relation to the particular illness being treated. No laws as yet have addressed this emerging issue.

Some have objected to legalization of medical cannabis for adolescent patients due to concerns that medical cannabis will be shared with other teenagers for whom it has not been prescribed. On the one hand, Daniel I. Rees, a professor of economics at the University of Colorado in Denver, notes, "There is anecdotal evidence that medical marijuana is finding its way into the hands of teenagers, but there's no statistical evidence that legalization increases the probability of use" (Medical Press, 2012). On the other hand, some substance abuse counselors have observed that medical cannabis is shared widely among teenagers and that some teenagers may be obtaining medical cannabis cards using false identification and falsified symptom reporting, merely so that they may have access to a legal source of marijuana (J. Burke, personal communication, December 12, 2012). In addition, a published investigation revealed that as much as 74% of adolescents in substance abuse treatment who smoked cannabis in Denver, Colorado, had utilized medical cannabis diverted from another teenager (Salomonsen-Sautel, Sakai, Thurstone, Corley, & Hopfer, 2012). This study leaves unclear the extent to which the majority of adolescents--who are not in substance abuse treatment--may be accessing diverted medical cannabis. Therefore, the verdict is out on this issue. Yet it is clear from many sources that adolescents who wish to use cannabis illegally usually are able to find it, whether or not medical cannabis is legal in their state. Furthermore, alcohol is the most abused substance among teenagers in the US, and it is illegal for all persons under age 21 throughout the country. As such, evidence exists that teenagers are able to find substances to abuse if they wish to do so, regardless of the legal status of such substances.

To summarize the scientific position on medical cannabis use in teenagers and children, the American Academy of Pediatrics issued a position paper in 2004 in which they recommended that cannabis not be legalized, but at the same time supported "rigorous scientific

research regarding the use of cannabinoids for the relief of symptoms not currently ameliorated by existing legal drug formulations" (Pediatrics, 2004, 1825). Since this position paper was published, multiple studies related to medical cannabis in general, and specifically in teenagers, have emerged, largely due to political movements that have legalized medical cannabis in many US states and thus made cannabis available for research experimentation. In 2010, the American Academy of Pediatrics issued an updated statement on cannabis use, concluding that "marijuana use is often portrayed as harmless, but the truth is that cannabis is an addictive drug that can cause serious risks and consequences" (American Academy of Pediatrics, 2011, 1). The statement listed the various negative effects of cannabis use with recommendations for how parents can keep their children from using cannabis. Some have criticized this updated statement as ignoring the potential benefits of medical cannabis use in minors and thus as motivated by financial concerns related to the influence of pharmaceutical companies. Nevertheless, this statement by the American Academy of Pediatrics remains the most authoritative statement available regarding cannabis use in minors.

It is important to clarify that this thesis is not advocating the legalization of medical marijuana for children or teenagers in the US. It is merely reviewing the existing literature, which leaves many unanswered questions. It is also important to note that, in many states, medical cannabis is currently illegal for children and teenagers, and any adult providing cannabis to a child would be considered guilty of child abuse in such states. Furthermore, in those states where medical cannabis is legal for children and adolescents, it must be utilized under the supervision of, and with a valid prescription from, a licensed medical practitioner, and may never be administered to a minor by an adult without this appropriate medical involvement.

Research Question

Because medical cannabis is becoming legal for child and adolescent patients in more US localities, it seems important to explore adults' perceptions of child and adolescent medical cannabis use. This thesis therefore poses the following research question: Are adults less likely to accept children's and adolescents' use of medical cannabis vs. adults' use? We hypothesize that, overall, adults will be less likely to accept the use of medical cannabis by minors.

Method

Participants

Initial emails presenting information about optional participation in this study were sent to 4,029 students. Students were enrolled at Kaplan University online, in online undergraduate or graduate psychology classes. All students are at least 18 years of age. Because this research involved data collection from Kaplan University students, it is subject to the terms and conditions of the Kaplan Legal Agreement.

Sampling Procedures

A list of students' names and email addresses was provided to the student by the Psychology Department. The email sent to students clearly stated that participation is voluntary and has no effect on a student's grades in any class at the university. The email pointed students to the psychology department research website (http://kustudentresearch.wordpress.com/), where the study was described in greater detail. The description of the study both here and in the informed consent (Appendix B) refer only to adults' perceptions of cannabis use and their opinions of medical use. Following participation in the research, those students who requested the study's results will receive a more detailed explanation of the study's intent and will be debriefed about why the particulars were not disclosed up front.

When students chose to participate, they clicked on a link that directed them to an online survey website that included an informed consent as the landing page (see Appendix B) as well as presented them with the reading comprehension experience. Data were collected automatically by the online survey website, SurveyMonkey, and downloaded at completion of data collection into an SPSS database for statistical analysis.

This study requested from the IRB a waiver of documented consent. The completion of the survey served as the consent to participate in this research.

The participants remain completely anonymous. The data collected cannot identify which students answered each question or their particular responses. The only potentially identifying questions on the survey are the age, gender, and ethnic background of the participants. This information allows the participants to remain anonymous, because the combination of demographics would not reasonably lead to deductive disclosure of any individual's identity. The participants' names, email addresses, and IP addresses were not collected by the survey tool. SurveyMonkey options were set properly to assure this.

All results are presented only in aggregate form to further protect subjects' identities. Data were accessible through the online survey system only by using a strong password known only to the researcher. Once the data were collected, they were downloaded into SPSS and deleted from the online survey system.

During this study, only the student researcher has had access to the file containing names and email addresses of the sample. The Psychology Department did not retain the source file. The student's file was maintained on a password-locked computer. Once the data were collected, however, this particular file was destroyed via consultation with a computer expert using current Department of Defense data destruction standards.

The thesis chair and the student researcher have access to the downloaded SPSS data. The data will be stored on the two computers owned by these individuals. The data will be placed in a separate Windows folder on each computer, segregated from any other files that are not related to the data set. The two computers are locked by strong Windows passwords, known only to the computer owners. Following completion of the research, the data set and related files will be retained by the researcher and adviser for a minimum of seven years in case questions arise about the analyses. The data set and related files will be transferred to any future computer owned by the researcher until the seven years have expired. Throughout the study and subsequent seven years, the thesis adviser will implement a weekly backup plan wherein the data set and related files are backed up using a secure online data backup system. The current system used is Qwest Personal Digital Vault. Details of this service's security policy can be found at this link: https://digitalvault.qwest.com/help.aspx. After the seven years, the researcher and thesis adviser will destroy the SPSS data file using then-current Department of Defense data destruction standards.

Measures

To evaluate the relationship between medicinal cannabis use by teens and children and peoples' perceptions of such use, a survey was developed to gather the appropriate information. The survey consists of several kinds of questions: 1) explanatory questions about people's feelings on general cannabis use; 2) medical questions about people's general habits in regards to medical card and/or doctors; and 3) adult's perceptions of their feelings of cannabis use by children and/or adolescents.

The survey consists of 27 questions that have rating scale answers. Examples of the questions include:

11. I think people who use cannabis are more laid back than those who don't.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree

8. I always follow my doctor's instructions or advice for my healthcare.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree

18. I think children and adolescents are not old enough to use cannabis, even if their parents and/or doctors believe this is the best treatment for their illness.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree

The survey was created by the student for the purpose of this specific thesis study. It was reviewed and elaborated by a doctoral level expert in survey design who used sound design methodology to properly word questions and develop standardized answer categories. This approach increases the chances that a newly designed survey will be reliable. However, without extensive reliability and validity testing, it is not possible to establish the reliability or validity of the instrument used in this investigation. As with many exploratory investigations of this kind, the survey used can be said to have face validity only.

Statistical Treatment

The questions in the survey will be divided into three groups: 1) subjects' general opinions about medical cannabis, 2) subjects' opinions about medical cannabis use in minors,

and 3) subjects' opinions about related concerns which may explain their opinions given to questions in groups one and two. A mean score for each group of questions will be created for each subject. To do so, answers for negatively phrased questions will be inverted to allow the creation of a single mean representing pro or favorable opinions about the topic of each question. Means scores for groups one and two will be contrasted using a *t* test, to determine if there is a statistically significant difference in subjects' support of medical cannabis use in general vs. medical cannabis use among minors. Then subjects will be classified into two groups, based on their mean score on the medical cannabis for minors questions: those above the mean, and those at or below the mean. What accounts for the differences between these two groups of child cannabis supporters vs. non-supporters will be analyzed using MANOVA, in relation to all 27 survey questions and sociodemographic data. The MANOVA will be followed by univariate ANOVAs with Bonferroni corrected p-values to adjust for family-wise error in significance testing, with p = .05/30, or 0017.

Results

An email asking students in the psychology department to participate in this research was sent to 4,029 graduate and undergraduate students. Of these, 225 students completed the survey. This yields a response rate of 6%. However, some email addresses were no longer active, and it is known that not all students read email at the address provided. Thus, it is not possible to know the exact response rate, although it is likely somewhat higher.

According to Table 1, most of the respondents were Caucasian women. However, there was a small percentage of men respondents; 21% were members of minority ethnic groups; and a wide age distribution ranged to over 60 years old. Because the population consisted entirely of university students, most respondents had at least two years of college.

Table 2 presents mean scores for all 27 survey questions, plus group means for all questions related to general medical cannabis use, childhood medical cannabis use, and related medical questions. The general cannabis questions had a total mean favorability rating of 3.60 out of 5, while favorability toward child and adolescent cannabis was at 3.12. A *t* test was used to compare favorability toward general medical cannabis use with favorability toward child medical cannabis use; $t(211) = 13.24$, $p < 0.001$. This is a highly statistically significant difference and it indicates that more people are in favor of medical cannabis in general than the use of medicinal cannabis for children and adolescents.

Subjects were then classified into two groups based on their mean favorability rating of medical cannabis for minors: those above the mean, and those at or below the mean. A MANOVA was run using all 27 survey questions and sociodemographic data as predictors.

Wilks' λ for the MANOVA was 0.24, $F(27,154) = 18.07$, $p < .0001$, indicating that the overall model was significant. To determine which specific individual variables account for the difference in subjects' favorability ratings of general medical cannabis vs. child medical cannabis use, univariate ANOVAs were conducted, setting the alpha level to .0017 using the Bonferroni method to correct for family-wise error in significance testing. Results of the ANOVAs suggest that the difference in subjects' favorability ratings toward adult vs. child medical cannabis use are unrelated to subject gender, age, education, or ethnicity. However, nearly all of the survey questions accounted for a significant portion of the variance in this difference, except for the non-cannabis medical questions; see Table 2.

Discussion

This study hypothesized that, overall, adults would be less likely to accept the use of medical cannabis by minors vs. medical cannabis use by adults. This hypothesis was confirmed,

with the mean favorability rating for adult medical cannabis use being significantly greater than the mean for child medical cannabis use. However, subjects' overall mean favorability toward childhood medical cannabis use still trended in the positive direction, at 3.12 out of 5. Subjects' favorability toward childhood medical cannabis use was unrelated to their age, gender, education level, and ethnic background. Thus, other factors must be considered to explain subjects' lower favorability ratings toward childhood medical cannabis use.

Bostwick (2012) talks about society wide changing attitudes toward cannabis and, because we found no connection in favorability ratings with a particular age, sex, race, or education group, we could posit that changing attitudes toward medical cannabis in general may account for the survey results. A related possibility involves the cultural shifts that began in the US during the 1960s. Since the oldest subjects in the present sample were in their 60s, most subjects were either participants in the cultural changes arising in the 1960s and later, or were children of those affected by the cannabis counterculture. Consistent with this explanation, respondents strongly agreed, 3.91 out of 5, that cannabis should be legalized throughout the US for medicinal purposes, and very strongly agreed, 4.40 out of 5, that cannabis users should not be incarcerated.

Currently, 19 US states and the District of Columbia (National Conference of State Legislatures, 2013) have opted for medical cannabis legalization, as well as complete recreational legalization being voted for in the states of Washington and Colorado in November 2012. Even so, medical cannabis is illegal at the federal level. Yet most subjects agreed, 3.66 out of 5, that not only should parents and doctors have the freedom to prescribe and seek the best treatment for their children, but many, 3.62 out of 5, also suggested that cannabis is an all-natural medication with fewer side effects than some prescription medications. Not only did respondents

believe parents should have the freedom to seek treatment for their children, but also that they would seek such treatment only when it is truly the best treatment for their child. Furthermore, respondents believe that this decision should be in the parent's and doctor's hands, not in the hands of the federal government. As such, the preponderance of opinion appears to contradict current federal policy.

However, in spite of clear majority support for legal medical cannabis throughout the nation, and majority support for childhood medical cannabis, support for childhood medical cannabis was significantly lower than that for adult medical cannabis. For example, among the childhood medical cannabis questions, the four lowest ratings suggest that most subjects believe that adolescents would be irresponsible with medical cannabis, that teens would be treated differently by their peer group if they used medical cannabis, that cannabis use would interfere with teens' school success, and that teens would share medical cannabis with their friends. It is unclear from the relatively sparse number of studies the extent to which these assumptions may be true, but they appear to exist in the population and were statistically significantly related to overall favorability toward childhood medical cannabis use.

Neighbors, Geisner, and Lee (2008) have considered the difference between descriptive norms, i.e., the perceived frequency of cannabis use, vs. injunctive norms, i.e., the perceived approval of cannabis use. In accord with this distinction, the current results suggest that adults have a more favorable perspective, 3.62 out of 5, on the issue of childhood medical cannabis legalization, a descriptive norm, than actually endorse such use, 2.34, an injunctive norm. This distinction between norms may thus explain, in part, subjects' lower answers to several of the injunctive norms questions pertaining to childhood medical cannabis use.

Overall, nearly every survey question was found to be significantly related to subject's favorability ratings toward childhood medical cannabis use. This very clear and consistent finding suggests that there may be a fundamental difference in opinion toward adults vs. childhood medical cannabis use, regardless of age, gender, education, ethnicity, or general attitudes toward cannabis. It is not clear what may explain this difference, although certain obvious possibilities present themselves, including parental protectiveness toward children, a tendency to want a more abundant factual basis and scientific consensus before exposing children to any form of medication, and perhaps simply lack of knowledge and familiarity with childhood medical cannabis use.

Perhaps surprisingly, questions regarding the social aspect of cannabis use, such as, "I believe cannabis users are lazy", or "I prefer to be friends with cannabis users", were not endorsed as negatively as it was originally theorized. Also, respondents largely felt that people who use cannabis can be productive and have good jobs, 3.96 out of 5, suggesting that the stereotype of cannabis smokers as "potheads" or unproductive may be shifting. These results were consistent across the wide range of sociodemographic groups represented in the sample. Yet it is possible, for example, that persons from the World War II generation or with significantly less educational attainment would respond differently on this survey.

There are several limitations to the present study. First, response rate was relatively low. Second, most of the respondents were women. Third, there is clear education bias, in that this survey was conducted using university students, who by definition have greater education on average than Americans in general. Fourth, the survey was developed solely for use in the present research, and thus lacks reliability and validity data. For these reasons, it is difficult to generalize the results beyond another population of university educated Americans.

Nevertheless, the findings remain suggestive and may warrant further investigation, particularly of the primary finding that subjects, regardless of sociodemographic background, appear less favorable to childhood medical cannabis use than adult medical cannabis use.

There are various ways to address these limitations. Since most respondents were women and studies show that men generally use cannabis more frequently than women, more male respondents would likely alter the results, and likely in a fashion consistent with favorability toward childhood medical cannabis use. Because of the obvious education bias, this survey could be replicated and delivered to other subsets using a method that captures those with less educational attainment, such as asking groups of subjects outside of a university environment. The present survey could be administered to subjects along with other questionnaires that have established reliability and validity, permitting an analysis of the reliability and validity of the current survey.

Finally, we found that respondents responded differently to questions about adolescents only than questions about children and adolescents. Perhaps because parents would have more control over the medication that young children would receive, there is less concern about these minors use of medical cannabis. Therefore, a survey containing questions separated into child (12 and under) and adolescent (12-18) sections could yield quite different results. Also, an important question to be added to the demographics section could be this: Are you a parent? Parents would have very different views on this issue, particularly parents of special needs children that would benefit from medicinal cannabis.

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APPENDIX A

Medical Marijuana Survey

For each statement below, please circle the number to the right which indicates your level of agreement with the statement. Thank you!

	1 Strongly Disagree	2	3	4	5 Strongly Agree
1. Cannabis is less dangerous than stimulant medications used to treat ADHD (Attention Deficit Hyperactivity Disorder).	1	2	3	4	5
2. Parents should have the option to give their children the medication that they and their doctors believe will benefit their children, including medical cannabis.	1	2	3	4	5
3. Adolescents are able to be responsible in using medical cannabis, if taught to use it properly.	1	2	3	4	5
4. Cannabis is an all-natural, herbal medication with fewer side effects than most prescription medications.	1	2	3	4	5
5. Cannabis should be legalized throughout the USA for medical purposes.	1	2	3	4	5
6. I am aware that medicinal cannabis has been shown effective for treating several common diseases of childhood and adolescence.	1	2	3	4	5
7. If my doctor were to prescribe medical cannabis, I believe my doctor would do so because s/he thinks it is best for me.	1	2	3	4	5
8. I always follow my doctor's instructions and advice for my and my family's healthcare.	1	2	3	4	5
9. I always do my own research about my or my family's medical care.	1	2	3	4	5
10. Cannabis has fewer side effects than medications used to treat many diseases that affect teens and children.	1	2	3	4	5
11. I think people who use cannabis are more laid back than those who don't.	1	2	3	4	5
12. I enjoy being friends with people who use cannabis.	1	2	3	4	5
13. The best medical decisions for children and adolescents are made by their parents and medical providers, not by the federal government.	1	2	3	4	5
14. I think people who use cannabis can still be productive and hold good jobs.	1	2	3	4	5
15. I believe that medical cannabis use may interfere with a child or adolescent's ability to function well and succeed at school.	1	2	3	4	5
16. Edible forms of cannabis, such as in food and pills, are acceptable for children and adolescents, but smoking cannabis is not.	1	2	3	4	5
17. I think people who use cannabis are lazy.	1	2	3	4	5
18. I think children and adolescents are not old enough to use cannabis, even if their parents and/or doctors believe this is the best treatment for their illness.	1	2	3	4	5
19. I prefer not to be around people when they are using cannabis.	1	2	3	4	5
20. If it was my choice, I would put people who use cannabis in prison.	1	2	3	4	5
21. I do not believe that medical cannabis should be legal for children or adolescents under any circumstances.	1	2	3	4	5

22. I believe that if we give adolescents access to cannabis for medical purposes, they will abuse it and will share it with their friends; thus medical cannabis for adolescents is not a safe idea.	1	2	3	4	5
23. I believe that medical cannabis should be legal for children and adolescents, but only for the most severe diseases such as cancer, so that its use by youth will be very rare.	1	2	3	4	5
24. I would vote for a medical cannabis law that allowed adults only, but not children, to use cannabis.	1	2	3	4	5
25. I believe children and adolescents might be treated differently by peers if they were to use medicinal cannabis.	1	2	3	4	5
26. No matter what the scientific evidence says, I would not endorse the use of medical cannabis by children or teenagers.	1	2	3	4	5
27. The use of cannabis is not against my value system.	1	2	3	4	5

Please complete the following questions for statistical purposes.

28. What is your gender?
    - □ Male
    - □ Female

29. What is your age group?
    - □ 18-25
    - □ 26-30
    - □ 31-40
    - □ 41-50
    - □ 51-60
    - □ 61 or older

30. What is your ethic background?
    - □ Caucasian
    - □ African-American
    - □ Hispanic
    - □ Asian-American
    - □ Native-American
    - □ Other: Specify _____

31. What is the highest education level you have reached?
    - □ Less than high school
    - □ High school diploma or GED
    - □ Some college
    - □ Four-year college degree
    - □ Graduate school

APPENDIX B

Kaplan University

Consent for Participation in Research

Adults' Perceptions of Medical Marijuana Use by Children and Adolescents

Why am I being asked?

You are being asked to be a participant in a research study about people's perceptions of medical cannabis (marijuana) use with children and adolescents. This study is conducted by Anna Levenson Butler, a Master's of Science in Psychology student at Kaplan University. You have been asked to participate in the research because you are a Kaplan student and may be eligible to participate. We ask that you read this form and ask any questions you may have before agreeing to be in the research.

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with Kaplan University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

What is the purpose of this research?

The purpose of this research is to understand how people might feel about children and/or teenagers using medically prescribed cannabis. Cannabis treats several diseases that affect children and adolescents.

What procedures are involved?

If you agree to be in this research, we would ask you to do the following things:

Fill out the survey that will take 5-10 minutes of your time.

Approximately 3,000 people may be involved in this research at Kaplan University.

What are the potential risks and discomforts?

Risks are anticipated to be minimal. It is possible, however, that some of the questions may lead you to feel slightly uncomfortable if imagining possible child or adolescent cannabis use is something that causes you distress.

Are there benefits to taking part in the research?

This is some of the first research of its kind. Participating in this research means you are of the first to give your opinions on this subject. This can help to guide future policy initiates and the may influence the public debate about medical cannabis laws.

What about privacy and confidentiality?

No one will know that you have participated in this study, because it is anonymous. It does not track your name, email address, or IP address in any way, so that you cannot be identified as an individual. Thus, no information about you, or provided by you during the research, will be disclosed to others. When the results of the research are published or discussed in conferences,

no information will be included that could ever reveal your identity. Again, any information that is obtained in connection with this study and that can be identified with you will remain anonymous.

Will I be reimbursed for any of my expenses or paid for my participation in this research?
There will be no payment given to subjects. You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study.

Who should I contact if I have questions?

The researcher conducting this study is Anna Butler, who can be contacted at anna.butler35@yahoo.com. You may ask any questions you have now. You may also contact the faculty adviser, Dr. Edward Cumella, at ecumella@kaplan.edu.

What are my rights as a research subject?
If you feel you have not been treated according to the descriptions in this form, or you have any questions about your rights as a research subject, you may contact the Institutional Review Board (IRB) at Kaplan University through one of the following representatives:

Susan Pettine, *IRB Chair*
Phone: (772) 607-1944
Email: spettine@kaplan.edu

Remember: Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

You can print a copy of this form for your information and to keep for your records.

Table 1

Socioecodemographic Characteristics of Participants

Sex	
Female	87%
Male	13%
Age Groups	
18-20	1%
21-29	30%
30-39	27%
40-49	26%
50-59	14%
60 and older	2%
Race	
African American	11%
Caucasian	79%
Hispanic	5%
Native American	2%
Other	3%
Highest Level of Education	
High School Diploma	5%
1 Year College	7%
2 Years College	14%

3 Years College	26%
Bachelor's Degree	8%
Some Graduate School	33%
Graduate Degree	6%

Table 2

Survey Questions and Mean Responses

	M(SD)
General Cannabis Questions	
Cannabis is less dangerous than stimulant medication.	3.57 (1.17)*
Cannabis is an all-natural, herbal medication.	3.62 (1.30)*
Cannabis should be legalized throughout the US.	3.91 (1.26)*
I believe my doctor would prescribe cannabis if it was best.	4.06 (0.96)*
People who use cannabis are more laid back.	3.54 (1.12)*
I like to be friends with cannabis users.	2.86 (0.97)*
Cannabis users can be productive and hold good jobs.	3.95 (1.03)*
People who use cannabis are not lazy.	3.81 (1.02)*
Like being around people who use cannabis.	2.92 (1.29)*
People who use cannabis should not be imprisoned.	4.40 (0.85)*
Cannabis use is not against my personal values.	3.16 (1.13)*
ALL GENERAL CANNABIS QUESTIONS COMBINED	3.60 (0.72)
Questions regarding children and adolescent use of cannabis	
Parents/doctors should decide on best treatment for children.	3.66 (1.27)*
Adolescents can be responsible with medical cannabis.	2.83 (1.25)*
Medical cannabis treats many diseases affecting children.	3.45 (1.17)*
Cannabis has fewer side effects than other medications.	3.09 (1.02)
Cannabis will not interfere with school success.	2.83 (1.20)*
Edible forms of cannabis are better than smoked cannabis.	3.32 (1.14)*
Children and adolescents are old enough to use cannabis.	3.16 (1.30)*

Medical cannabis should be legal for children and adolescents.	3.62 (1.26)*
Children & adolescents will not abuse cannabis & share with friends.	2.79 (1.11)*
Cannabis should only be legal in extreme cases for children.	3.31 (1.09)*
I would vote for a cannabis law for adults only.	2.61 (0.97)*
Children will be treated differently if they use medicinal cannabis.	3.63 (1.24)*
I will not endorse medicinal cannabis by teens and children.	2.34 (1.17)*
ALL CHILD/ADOLESCENT CANNABIS QUESTIONS COMBINED	3.12 (0.68)
Questions related to cannabis and medicine	
I always follow my doctor's instructions for my care.	3.56 (1.07)
I always do my own medical research.	4.16 (0.85)
The best medical decisions for children are made by the government.	1.63 (0.80)*
ALL CANNABIS AND MEDICINE QUESTIONS COMBINED	3.12 (0.45)

Note. Wilks' λ for the MANOVA = 0.24, $F(27,154) = 18.07$, $p < .0001$. *$p < .0017$.