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Perceptions of Social Norms and Exposure to Pro-Marijuana Messages Are Associated with Adolescent Marijuana Use

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Abstract

Despite consistent declines in rates of cigarette use among adolescents in the last five years, rates of marijuana use have remained constant, with marijuana being the most widely used illegal drug among adolescents. More work is needed to understand how social norms, perceived risks and benefits, and social media messaging impact use of marijuana. This study compared perceptions and social norms related to marijuana, blunts and cigarettes. Additionally, we assessed how perceptions related to social norms, risks and benefits, and exposure to pro- versus anti-marijuana messaging is related to use. Participants were 786 adolescents from Southern and Northern California (36.7% male, 63.3% females; mean age = 16.1 years; SD = 1.6). Participants came from diverse ethnic backgrounds, with 207 (26.61%) White, 171 (21.98%) Asian/Pacific Islander, 232 (29.82%) Hispanic, and 168 (21.59%) other. Results indicated that marijuana and blunts were consistently perceived as more socially acceptable and less risky than cigarettes ($p<0.01$). Participants who reported that their friends used marijuana had a 27% greater odds of using marijuana themselves. Further, seeing messages about the good things or benefits of marijuana use was associated with a 6% greater odds of use [OR 1.06 (CI 1.00, 1.12)]. This study's findings offer a number of important public health implications, particularly as states move towards legalization of marijuana for recreational use. As this occurs, states need to take adolescents' perceptions of risks, benefits, social norms, and peer influences into account as they implement strategies to reduce youth use of marijuana and blunts.

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Contributors' Statements

Dr. Roditis helped conceptualize and design the study, designed and reviewed all analyses, drafted the initial manuscript, and approved the final manuscript as submitted.

Dr. Delucchi carried out all analyses, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Ms. Chang conducted a literature review, reviewed and revised the manuscript and approved the final manuscript as submitted.

Dr. Halpern-Felsher conceptualized and designed the study and survey, designed, supervised, and reviewed all analyses, drafted the initial manuscript, and approved the final manuscript as submitted.

Keywords

public health; adolescent health; marijuana use; blunt use; social norms; adolescent perceptions; media and advertisements

1. Introduction

Despite consistent declines in rates of cigarette use among adolescents in the last five years, rates of marijuana use have remained constant, with marijuana being the most widely used illicit drug among adolescents (Miech et al., 2015). Nationally representative data from Monitoring the Future show rates of conventional cigarette use among 10th graders declining significantly from 9.1% in 2013 to 7.2% in 2014; and among 12th graders from 16.3% in 2013 to 13.6% in 2014 (Miech et al., 2015). Rates of marijuana use have remained stable, with 16.6% of 10th graders and 21.2% of 12th graders reporting past 30-day use in 2014 (Miech et al., 2015). Blunts (marijuana rolled in tobacco leaf) have become a common form of marijuana among adolescents, with more than half of 30-day marijuana users also reporting blunt use (Golub et al., 2006; Delnevo et al., 2011).

Adolescents' perceptions related to marijuana use have also changed, with the number of youth who perceive significant risk from using marijuana once or twice a week decreasing from 54.6% in 2007 to 39.5% in 2013 (Miech et al., 2015). Moreover, 73.3% of 10th graders reported disapproval of occasional marijuana use in 2007, yet 62.9% reported disapproval in 2014 (Miech et al., 2015). Social media is a key venue for sharing marijuana-related information and attitudes, particularly among adolescents. For example, between 2012 and 2013, more adolescents than adults tweeted about marijuana, with the majority of these tweets reflecting positive attitudes about marijuana (Thompson et al., 2015).

Social acceptability and perceptions of risks and benefits, including the active sharing of these beliefs on social media, are important predictors of health behavior decision-making (Ennett et al., 2008; Alexander et al., 2001; Song et al., 2009; Rodriguez et al., 2007; Halpern-Felsher et al., 2004). Perceptions of risks generally vary by sex and age, with females and minorities tending to rate perceived risks higher than white males (Slovic, 2000). Additionally, perceptions of risk related to marijuana use are known to be higher among females, non-whites, older adults, and individuals who have a family income between $20,000-49,999 (Pacek et al., 2015). However, few studies have examined adolescents' beliefs about specific risks and benefits related to marijuana and blunts, and studies have not examined relationships among adolescents' perceptions, social acceptability, awareness of social media and actual marijuana use (Goldberg et al., 2009; LaBrie et al., 2011). Understanding these relationships is critical, especially since smoking marijuana places one at risk for a number of the same negative health outcomes and secondhand smoke effects as smoking conventional tobacco cigarettes (Wang et al., 2014). Long-term use of marijuana can lead to addiction, with initiation in adolescence associated with higher rates of addiction, negative impacts on brain development, and lower levels of school and lifetime achievement (Bray et al., 2000; Brook et al., 2013; Hall & Degenhardt, 2009; Meier et al., 2012; Volkow et al., 2014; Zalesky et al., 2012). There is also concern

that using both marijuana and tobacco at the same time (i.e., blunts) can reinforce the rewarding effects of both substances (Viveros et al., 2006).

Using a sample of 9th and 12th grade students recruited from California schools, this study addresses important gaps in the literature by first reporting adolescents' rates and patterns of use of and access to marijuana, blunts, and cigarettes. Second, this study examines and compares adolescents' perceived prevalence, social acceptability, and risks and benefits of marijuana, blunts, and cigarettes. Lastly, this paper assesses to what extent these factors are associated with actual use of marijuana. Such information is important in order to inform the creation of better education and warning messages, especially as marijuana and blunt use increases in popularity and moves from an illicit drug to a legal drug for recreational use (Lyman & Haugh, 2014).

2. Methods

2.1. Participants

This study utilized a convenience sample, in which we recruited participants from 10 large high schools throughout California. These schools were diverse with respect to geographic location (urban, suburban, and rural), race/ethnicity, and socioeconomic status (SES); and were schools that were willing to participate in the study. Researchers introduced the study and invited all ninth and 12th graders to participate, during which time they provided students with consent forms for parents and students 18 and over, assent forms for students under age 18, and project information to take home and discuss with their parents/guardians.

Approximately 4,000 students learned about the study, of whom 1,299 returned signed consent/assent forms; 405 (31.1%) of the consented students were disqualified from the study because of incorrect contact information, being in the wrong grade, or non-response to subsequent contact. Overall, 786 (87.9%) of eligible consented students completed the survey. There were some small but non-meaningful racial/ethnic differences between those who did and did not complete the survey; however, there were no differences by mother's education.

The sample size was designed to allow sufficient power (80%) to detect the contrasts of interest. The sample included 484 (63.21%) females and 281 (36.67%) males; mean age = 16.1 (SD=1.6). Participants were ethnically diverse, with 207 (26.61%) White, 171 (21.98%) Asian/Pacific Islander, 232 (29.82%) Hispanic, and 168 (21.59%) other. Demographics of the students who participated in the study reflected the demographic make-up of their respective schools.

2.2. Procedures

Participants were sent an email with a link to the online survey, administered through Qualtrics. The order of questions and queries about marijuana blunts, and cigarettes were counterbalanced in order to control for order effects. Participants received $10.00 for participating. Procedures for this study were approved by our university's institutional review board.

2.3. Measures

The survey included 125 questions addressing a number of research questions; and took participants between 30 and 60 minutes to complete. Participants were allowed as much time as they wanted to complete the survey, although they were encouraged to complete the survey at one time to increase confidentiality of their responses. Only those measures related to the current study are reported here. Comprehensive results regarding the cigarette use data can be found in Roditis et al. (2016). Many measures were derived from past surveys on adolescents' attitudes towards substances, including those that have tested the validity of the assessments (Chaffee et al., 2015; Goldberg et al., 2009; Halpern-Felsher et al., 2004; Roditis et al., 2016; Song et al., 2009). All measures were pilot tested with adolescents of the same age and demographics of our sample. Participants indicated items that were not clear, and then we revised the survey and pilot tested it again until all measures were clear. Most items were continuously scored; the few that were dichotomized are noted below.

2.3.1. Never/ever use—Participants were asked: "During your entire life, how many times have you ever used [cigarettes, marijuana, blunts]?" Responses were then dichotomized so that individuals were categorized as "ever users" if they used the product at least once, and "never users" if they reported never using the product.

2.3.2. Patterns of and access to marijuana use—Participants answered the following questions: "Where did you get [marijuana, blunts] the last time you used them?" "When you use [marijuana, blunts], where is the place you use them most often?" "When do you use [marijuana, blunts] most often?" and "With whom do you use [marijuana, blunts] most often?"

2.3.3. Social Norms—Participants answered the following questions regarding perceived prevalence of use: "As far as you know has your mother/female guardian; father/male guardian; siblings; closest friends ever used the following," and "Out of 100 teens your age and race/ethnicity, how many do you think use [cigarettes, marijuana, blunts]?" Participants answered the following question regarding perceived acceptability, "Friends think it is socially acceptable to use [cigarettes, marijuana, blunts]."

2.3.4. Perceptions of short-term health risks, short-term social risks and benefits—Participants indicated the likelihood of experiencing several short-term social and health risks and benefits if they were to just start using each product. The risks and benefits included: friends will be upset with you, you'll get in trouble, get bad breath, bad cough, cold, trouble catching breath, mouth sores, worse performance in sports, you'll look cool, you'll look more mature, and you'll fit in with your peers (Halpern-Felsher et al., 2004; Roditis et al., 2016).

2.3.5. Receptivity to marketing—Participants were asked: "Do you or your friends own any promotional materials for [marijuana, blunts]," coded as yes/no, and "How likely is it that you would wear promotional items for [marijuana, blunts]," coded as very likely to very unlikely.

2.3.6. Social media—Participants answered the following: “Have you ever seen a message posted on social media about [the risks or bad things/benefits or good things] related to using marijuana/blunts?” and “have you ever posted a message on social media about [the risks or bad things; the benefits or good things] related to using marijuana/blunts?” Responses were dichotomized into yes and no.

3. Analysis

Differences in perceptions of risks and benefits and social norms across products were assessed using a generalized linear model with the generalized estimating equation method and an exchangeable correlation matrix to adjust the variance estimates for non-independence within school as implemented in Proc Genmod of SAS, v94. Post hoc testing utilized Tukey-Kramer tests. The relationship among marijuana use, perceptions of social norms, risks and benefits, and viewing of ads on social media was assessed using logistic regression. The outcome variable, marijuana use, was coded into 2 categories of never used and ever used. Predictor variables included: (1) perceived prevalence variables, (2) perceived risk and benefit variables factor analyzed into the following categories: health and social risks, benefits, and risk of addiction, and (3) awareness of social media attitudes and beliefs related to marijuana. Age, sex, and race/ethnicity were also included in the model; however, interactions with sex and race/ethnicity were not significant and therefore were removed in the final model. Missing data, which was negligible and varied item to item, were left missing. SPSS version 23 was used for the descriptive analyses.

4. Results

4.1. Use/dual use and access to marijuana, blunts and cigarettes

Among the participants, 98 (12.63%) had ever tried cigarettes, 195 (25.13%) had ever tried marijuana, and 142 (18.30 %) had ever tried a blunt. Of the 98 students who had ever used a cigarette, 75 (76.53%) had used marijuana and 61 (62.24%) had also used a blunt. Of the 195 ever marijuana users, 75 (38.46%) had used cigarettes and 140 (71.79%) had used a blunt. Of the 142 blunt users, 61 (42.96%) had used a cigarette.

The majority of ever marijuana or blunt users reported getting these products from friends the last time they used them (62.0% and 60.5%, respectively), tended to use these products with friends (79.5% and 76.8%, respectively), and most used them at friends’ houses (46.3% and 46.7%, respectively). Ever marijuana or blunts users reported use most often when stressed out (46.2% and 45.8%, respectively; see Table 1).

4.1.1. Social Norms—There were significant differences in participants’ reports of mother, father, sibling, and friend use of these products. Participants reported lower rates of marijuana and blunt use and higher rates of cigarettes use among adult figures in their lives. Conversely, participants reported much higher rates of marijuana than cigarette use among friends (with 51.2% of participants reporting that their friends use marijuana). They perceived significant differences in rates of use among peers, reporting that 50.92% of their peers had ever used marijuana, 42.63% had ever used blunts and 34.43% had ever used

cigarettes. Participants viewed marijuana and blunts as more socially acceptable than cigarettes (See Table 2).

4.1.2. Perceptions of risks and benefits—Participants rated cigarettes as being overall more harmful to their health, more harmful to their friends' health, more harmful to the environment, and more addictive than marijuana or blunts ($p<0.01$). Post-hoc analyses showed that participants perceived marijuana as more harmful to the environment than blunts, and perceived blunts as more likely to lead to addiction than marijuana. Participants viewed marijuana and blunts as similarly risky when it comes to their and their friends' health ($p<0.01$; see Table 2).

Generally, participants rated marijuana and blunt use as less likely to result in short-term health risks than cigarettes, with post-hoc analyses showing that they viewed marijuana and blunts as similarly risky. Participants also rated marijuana and blunt use as less likely than cigarettes to result in the short-term social risks of friends getting upset and bad breath. Participants reported no difference in the likelihood of getting in trouble from using marijuana, blunts, or cigarettes. Adolescents rated marijuana and blunts as more likely to confer social benefits of looking cool and fitting in than cigarettes, though they rated all products as equally likely to make them look mature.

Participants rated marijuana and blunts as less likely to make them feel jittery or nervous, more likely to reduce stress, and more likely to make them feel high or buzzed than cigarettes. They rated all three products as equally likely to help with concentration. Marijuana and blunts were rated as less addictive, and easier to quit than cigarettes (see Table 2).

4.2. Marketing

4.2.1. Social Media—A similar number of participants reported seeing messages on social media about the risks and benefits related to marijuana use (51.9% and 52.7%, respectively). Additionally, 34.4% reported seeing messages about risks related to blunt use and 28.6% reported seeing messages on benefits related to blunt use. A smaller number of participants reported actively posting online about these products, with 13% posting about the risks related to marijuana use, 10.9% posting about the benefits, 10.1% posting about the risks of blunt use, and 4.6% posting about the benefits of blunts (see Table 3).

4.2.2. Receptivity to marketing—While only 3.0% and 1.5% of participants reported owning a promotional item for marijuana or blunts respectively, they reported that 31.7% and 18.2 of friends owned a promotional item for marijuana or blunts, respectively. Adolescents reported that they were generally unlikely to wear promotional items for marijuana or blunts (see Table 3).

4.3. Factors related to marijuana use

Perceptions of social norms, health and social risks, awareness of social media, and age were all associated with marijuana use. Individuals who reported that close friends used marijuana had a 27% greater odds of having ever used themselves [OR 1.27 (CI 1.20, 1.34)].

Individuals who reported having seen a message on social media about the benefits of using marijuana use had a 6% greater odds of having used themselves [OR 1.06 (CI 1.00, 1.12)]. For every unit increase in perceptions of health and social risks related to use there was a corresponding .001% greater odds of not using marijuana [0.999 (CI 0.997, 0.999)]. Finally, for every year increase in age, there was a corresponding 6% greater odds s of using marijuana [OR 1.06 (CI 1.03, 1.09)] (see Table 4).

5. Discussion

Use rates in this study were highest for marijuana, followed by blunts and cigarettes. Most adolescents who use these products get them from friends, use them in friends' houses, and when they feel stressed.

Adolescents perceived lower marijuana and blunt use but higher cigarette use among parents. Conversely, adolescents perceived higher use of marijuana and blunts and lower use of cigarettes among their siblings and peers. These differences in perceived use may reflect current trends in adolescent marijuana and cigarette use nationwide, in which rates of cigarette use is much lower than marijuana use, with cigarette use continuing to decline, marijuana use remaining higher (Miech et al., 2015), and rates of marijuana use being higher among adolescents and young adults compared to adults (Center for Behavioral Health Statistics and Quality, 2015).

While approximately a quarter of participants report having used marijuana, they thought that more than half of their friends have used marijuana. Importantly, participants who reported that their friends used marijuana had a 27% greater odds of using marijuana themselves. Previous studies also show relationships between friend drug use and adolescent drug use, and friend use is a powerful influence on adolescents' social norms and acceptability of particular behaviors (Duan et al., 2009). The fact that participants report friend use rates of marijuana as double that of self-reported use may be reflective of changing social norms in which marijuana use is seen as an acceptable and common behavior, which, in turn, may be influencing decisions to use (Godin & Kok, 1996; Madden et al., 1992).

Marijuana and blunts were generally perceived as more socially acceptable, less risky, and more beneficial than cigarettes. Despite the fact that blunts contain nicotine yet marijuana doesn't, adolescents didn't perceive differences in the likelihood of becoming addicted or being able to quit marijuana or blunts, although adolescents rated marijuana as more addictive than blunts. This is of particular importance, as it is possible that using both tobacco and marijuana together (as occurs with blunts) may actually increase the addictive potential of these products (Volkow et al., 2014). While perceptions of benefits and addiction were not related to use in this study, perceptions of greater health and social risks were associated with lesser odds of using marijuana. Other studies have also found risk perceptions related to use (Song et al., 2009; Rodriguez et al., 2007; Roditis et al., 2016). The fact that perceptions of benefits were not related to use is surprising as other studies have found perceptions of benefits to predict use (Slovic, 2000). It is possible that perceived social norms are more important drivers of adolescents' decisions to use marijuana than

perceived risks and benefits despite the fact that these constructs are linked (Center for Behavioral Health Statistics and Quality, 2015; Duan et al., 2009).

While perceptions of benefits of marijuana were not related to use, seeing messages about the good things or benefits of marijuana use was associated with a 6% greater odds of use. In contrast, despite adolescents seeing ads for both risks and benefits of marijuana, messages regarding risks were not related to use. It is possible that individuals who use marijuana are actively seeking and more aware of messages related to benefits of marijuana use.

There are limitations to this study. The data are self-reported. Further, given the cross-sectional nature of our data, we cannot suggest a causal relationship between factors associated with marijuana use and marijuana use itself. Additionally, some of the factors associated with marijuana use have a confidence interval approaching 1.0. Finally, these data were collected throughout Northern and Southern California and thus are not nationally representative.

Despite these limitations, this is one of the few studies to assess perceptions of social norms, risks and benefits for marijuana, blunts, and cigarettes. Additionally, this study assessed how these factors as well as awareness of social media are related to marijuana use. Results from this study offer a number of important public health implications, particularly as states move towards legalization of marijuana for recreational use. As this occurs, states need to take adolescents' perceptions of risks, benefits, social norms, and peer influences into account. Though there is mixed evidence on how legalization impacts adolescent marijuana use, advocates for marijuana legalization argue that legalization itself does not increase use among youth (Wall et al., 2011; Lynne-Landsman et al., 2013). However, there is no evidence that legalization alone does anything to decrease use or access among adolescents.

The results from this study have a number of implications for prevention strategies. Perceived rates of marijuana use among friends is higher than participant self-reported use rates and reported national averages of adolescent use. This finding is similar to findings in the alcohol use literature, which finds that youth and young adults tend to overestimate rates of binge drinking. Importantly, dispelling this misperception has been used effectively in a number of social norms campaigns focused on reducing binge drinking in college campuses (DeJong et al., 2006; LaBrie et al., 2010). This suggests that using a similar social norms marketing approach, in which youth learn that rates of marijuana use among peers are much lower than they think, may be a useful strategy to prevent use.

In this study, both perceived friend use and having seen positive messages about marijuana was associated with greater odds that an adolescent used marijuana. These findings also suggest the need for marketing, education and intervention strategies that specifically tackle social acceptability and peer use.

This study also shows that adolescents perceive marijuana and blunts to be significantly less harmful than cigarettes, despite the fact that all of these products are combustible smoking products. Additionally, despite the fact that blunts have nicotine, adolescents did not perceive these to be more addictive than marijuana. These findings suggest that there is also a need for educational and marketing campaigns that realistically address what the risks of

marijuana and blunt use are for both youth and adults, including risks of addiction. National, state, and local public health agencies should consider lessons learned from regulatory and informational strategies that have been used in tobacco control, and should implement such strategies before legalization occurs (Barry et al., 2014).

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Highlights

- To understand adolescents' perceptions of marijuana and blunts.

- Understand how social norms, perceived risks and benefits, and social media are associated with adolescent marijuana use.

- Participants who reported that their friends used marijuana had a 27% greater odds of using marijuana themselves.

- Seeing messages about the good things or benefits of marijuana use was associated with a 6% greater odds of use

TABLE 1

ACCESS TO AND PATTERNS OF PRODUCT USE AMONG EVER MARIJUANA AND BLUNT USERS

	Marijuana N (%)	Blunts N (%)
Where did you get [marijuana/blunts] the last time you used them?		
A friend gave them to me	121 (62.0)	86 (60.5)
I bought them myself	33 (16.9)	22 (15.5)
I bummed it from someone	17 (9.0)	12 (9.0)
A friend bought them for me with my money	10 (5.3)	12 (9.0)
Someone in my family gave them to me	5 (2.7)	4 (3.0)
I took them from someone without that person knowing	3 (1.6)	1 (0.7)
Someone in my family bought them for me	1 (0.5)	0
When you use [marijuana/blunts], where are the places you use them most often?		
Friends house	87 (46.3)	64 (46.7)
Party	66 (33.8)	48 (33.8)
In a car or parking lot	37 (19.7)	30 (21.9)
Other	28 (14.9)	17 (12.4)
Home	27 (13.8)	16 (12.0)
School	12 (6.4)	7 (5.1)
When you use [marijuana/blunts], with whom do you use them most often?		
With friends	155 (79.5)	109 (76.8)
With my boyfriend or girlfriend	20 (10.6)	14 (10.2)
Alone	20 (10.2)	11 (7.7)
With strangers like at a party	20 (10.2)	18 (12.7)
With a sibling	13 (6.9)	9 (6.5)
With a parent	3 (1.6)	2 (1.5)
When do you use [marijuana/blunts] most often?		
When I'm feeling stressed out	90 (46.2)	65 (45.8)
If I'm drinking alcohol	32 (16.4)	23 (16.2)
Before or after a meal	34 (18.1)	23 (16.7)
After having an argument with a friend	9 (4.8)	7 (5.1)
When studying	6 (3.2)	5 (3.6)
When I first wake up	5 (2.7)	3 (2.2)

TABLE 2

DIFFERENCE IN SOCIAL ACCEPTABILITY, RISK, AND BENEFIT PERCEPTIONS OF MARIJUANA, BLUNTS, AND CIGARETTES

	Marijuana	Blunt	Cigarette	Chi-Sq (Wald)	Significant Post-hoc comparisons
Perceived Prevalence[1]	N (%)Yes	N (%)Yes	N (%)Yes		
Mother Uses*	108 (16.4)	60 (9.2)	199 (29.4)	221.35	*a, b, c*
Father Uses*	135 (20.1)	80 (11.9)	247 (36.7)	30.35	*a, b, c*
Sibling Uses*	162 (24.1)	121 (18.1)	100 (14.9)	150.33	*a, b, c*
Friends Use*	345 (51.2)	287 (42.6)	192 (28.7)	165.79	*a, b, c*
Social Acceptability	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)		
Out of 100 students your age and ethnicity, how many do you think use?*[2]	50.92 (27.95)	42.63 (29.08)	34.43 (25.03)	181.86	*a, b, c*
How socially acceptable do you think use of the product is?[3]	2.06 (1.05)	1.95 (0.99)	1.63 (0.78)	193.44	*a, b, c*
Perceived Overall Harm[4]	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)		
How addictive are these products?*	3.6 (1.20)	3.51 (1.37)	4.24 (1.20)	191.44	*a, b, c*
How harmful are these products to your own health?*	3.75 (1.28)	3.86 (1.14)	4.66 (0.65)	193.58	*a, b, c*
How harmful are these products to your friend's health?*	3.37 (1.30)	3.44 (1.21)	4.14 (0.92)	134.27	*a ,c*
How harmful are these products to the environment?*	3.36 (1.34)	3.50 (1.25)	4.17 (0.97)	305.13	*a, b, c*
Perceived Health Risks[2]	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)		
Bad Cough*	61.89 (31.75)	64.37 (30.49)	76.20 (24.97)	107.55	*a ,c*
Cold*	44.17 (33.60)	45.73 (33.25)	77.9 (31.34)	92.42	*a ,c*
Trouble Catching Breath*	60.94 (31.32)	63.88 (30.27)	63.50 (23.79)	119.69	*a, b, c*
Perceived Social Risks					
Friends Upset*	59.50 (39.86)	61.17 (39.15)	74.40 (31.24)	132.36	*a ,b, c*
Get in Trouble	79.66 (29.95)	80.32 (29.29)	79.80 (30.45)	4.15	
Bad Breath*	71.74 (32.61)	72.86 (31.64)	88.51 (20.57)	362.41	*a, b, c*
Perceived benefits[2]	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)		
Look Cool*	23.13 (33.67)	22.30 (33.25)	15.64 (28.01)	409.97	*a ,c*
Mature	16.57 (29.48)	16.30 (29.26)	17.17 (29.21)	0.35	
Fit in*	25.67 (35.44)	24.33 (34.89)	13.24 (25.71)	132.75	*a ,c*
Perceived addictive and pharmacological effects[2]	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)		
Will become addicted*	61.77 (35.41)	61.29 (35.34)	78.05 (29.47)	147.95	*a ,c*

	Marijuana	Blunt	Cigarette	Chi-Sq (Wald)	Significant Post-hoc comparisons
Will still be using product in 5 years*	54.81 (35.48)	53.31 (35.73)	64.60 (36.81)	87.05	*a, b, c*
Can quit if wish to*	50.54 (36.76)	50.27 (37.02)	39.31 (35.48)	132.97	*a ,c*
Jittery/nervous*	53.42 (35.05)	53.90 (34.43)	64.02 (29.81)	40.25	*a ,c*
High or buzzed*	85.60 (24.47)	83.84 (25.33)	43.89 (36.16)	373.41	*a, b, c*
Better concentration	16.92 (27.49)	15.68 (26.31)	15.16 (26.09)	4.85	
Less stress*	49.46 (35.97)	48.04 (35.86)	40.03 (33.67)	33.65	*a ,c*

[1]Responses to these questions were “Yes,” “No,” “I don't know,” and “Does not apply.”

[2]Responses to these questions ranged from 0 to 100.

[3]Responses to these questions were on a 1 to 5 scale, with 1 representing “strongly disagree” and 5 representing “strongly agree.

[4]Responses to these questions were on a 1 to 5 scale, with 1 representing “not at all harmful” and 5 “extremely harmful.”

[a]cig × blunt

[b]blunt × marijuana

[c]marijuana × cig

*Significant at the $p < 0.01$

TABLE 3

USE OF SOCIAL MEDIA AND RECEPTIVITY TO MARKETING

	Marijuana	Blunt
Social Media		
Have you ever seen a message posted on social media about the risks or bad things related to using the products below? N (%)Yes	339 (51.8)	224 (34.4)
Have you ever seen a message posted on social media about the benefits or good things related to using the products below? N (%) Yes	345 (52.7)	186 (28.6)
Have you ever posted a message posted on social media about the risks or bad things related to using the products below? N (%) Yes	85 (13.0)	66 (10.1)
Have you ever seen a message posted on social media about the benefits or good things related to using the products below? N (%) Yes	72 (10.9)	30 (4.6)
Receptivity to Marketing		
Do you or your friends own any promotional materials for the following products?		
N (%) Yes I do	22 (3.0)	11 (1.5)
N (%) Yes my friend does	236 (31.7)	137 (18.2)
How likely is it that you would ever use or wear a promotional item for the following products? – $\bar{x}$ (SD	3.64 (0.81)	3.76 (0.69)

TABLE 4

ODD RATIOS FOR PREDICTORS OF EVER USING MARIJUANA

	Odds Ratio	95% Confidence Interval
Social acceptability		
Father uses marijuana	1.08	0.95-1.23
Close friends use marijuana	1.27	1.20-1.34
Out of 100 youth your age and ethnicity, how many do you think use marijuana	1.00	1.00-1.00
Risks and benefits		
Health and social risks of marijuana use	0.999	.997-.999
Benefits of marijuana use	1.00	1.00-1.00
Risk of addiction (marijuana)	1.00	1.00-1.00
Social Media		
Ever seen a message posted on social media about the benefits or good things of using marijuana	1.06	1.00-1.12
Ever seen a message posted on social media about the risks or bad things of using marijuana	1.02	0.94-1.10
Age	1.06	1.03-1.09