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Adolescents' Attitudes toward Anti-marijuana Ads, Usage Intentions, and Actual Marijuana Usage

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Abstract

The association of adolescents' appraisals of the anti-marijuana television ads used in the National Youth Anti-drug Media Campaign with future marijuana use was investigated. The 12 to 18 year old respondents ($N = 2993$) were first classified as users, resolute nonusers, or vulnerable nonusers (Crano, Siegel, Alvaro, Lac, & Hemovich, 2008). Usage status and the covariates of gender, age, and attitudes toward marijuana were used to predict attitudes toward the ads (A_{ad}) in the first phase of a multi-level linear analysis. All covariates were significantly associated with A_{ad} , as was usage status: resolute nonusers evaluated the ads significantly more positively than vulnerable nonusers and users (all $p < .001$), who did not differ. In the second phase, the covariates along with A_{ad} and respondents' usage status predicted intentions and actual usage one year after initial measurement. The lagged analysis disclosed negative associations between A_{ad} and usage intentions, and between A_{ad} and actual marijuana use (both $p < .05$); however, this association held only for *users* ($p < .01$), not vulnerable or resolute nonusers. Users reporting more positive attitudes towards the ads were less likely to report intention to use marijuana and to continue marijuana use at 1-year follow-up. These findings may inform designers of persuasion-based prevention campaigns, guiding pre-implementation efforts in the design of ads that targeted groups find appealing and thus, influential.

Keywords

Adolescents; Attitudes; Attitudes toward the ad; Mass media; Advertisements; Marijuana; Prevention

Despite decades of refinement and expenditures in the billions of dollars, mass media campaigns designed to prevent or reduce substance use have met with inconsistent results (Crano, Siegel, & Alvaro, in press). Campaigns have aimed to deter drunk driving (DeJong & Atkin, 1995; Elder et al., 2004; Perkins, Linkenbach, Lewis, & Neighbors, 2010), smoking (Botvin & Eng, 1980; Fishbein, Hall-Jamieson, Zimmer, von Haeften, & Nabi, 2002; Vallone et al., 2010), and use of illicit drugs (Block, Morwitz, Putsis, & Sen, 2002; Hornik, et al., 2008; Palmgreen, Lorch, Stephenson, Hoyle, & Donohew, 2007). Since 1998,

the U.S. has spent over \$1.6 billion in drug prevention campaigns (<http://www.gao.gov/assets/260/251217.pdf>).

Such campaigns are popular because of their promise to reach wide audiences in a cost-effective manner (Farrelly, Hussin, & Bauer, 2007; Goldman & Glantz, 1998). Nationwide, positive prevention effects could benefit hundreds of thousands of would-be or current users (Noar, 2006a, 2006b). Unfortunately, analyses suggest that prevention campaigns have not always fulfilled the high hopes of their designers (Brinn, Carson, Esterman, Chang, & Smith, 2010; Crano, 2010; Crano & Burgoon, 2002; Hornik, et al., 2008). One such instance involves the National Youth Anti-drug Media Campaign (the Campaign). Analyses of data from a four-year panel survey conducted in concert with the Campaign, Hornik and colleagues found little preventive effect. Disturbingly, at some points, greater ad exposure was associated with lower intentions to avoid marijuana use and weaker adherence to anti-drug norms. This result might have been anticipated from the results of examinations of a sample of ads used in the Campaign (Fishbein, Cappella, et al., 2002; Fishbein, Hall-Jamieson, et al., 2002) indicating that while some ads were perceived as more effective than controls, others were associated with increased likelihood to try or use drugs.

A reexamination of the typical unsuccessful media campaign revealed that although some (not all) were based on a guiding theoretical model, these models functioned at a level that was too abstract to provide specific guidance regarding *what* to say in a persuasive message, and *how* to say it (Crano et al., in press). We propose that a more focused consideration of the role of persuasive message design will form the basis for more rapid progress. Examining receivers' reactions to ads, and the relationship between these evaluations and drug use outcomes, the goal of the current study, will allow for more effective and informed development of prevention ads.

Importance of Targets' Message Evaluations

When developing effective drug prevention campaigns, it would seem imperative to consider receivers' evaluations of the persuasive messages to be employed. The answer to the question, "Does it matter if the targets of a persuasive campaign evaluate its messages positively?" seems self-evident, but current practice appears to belie the obvious. Despite budding interest by communication researchers (Cho & Boster, 2008; Slater & Kelly, 2002) and an extensive marketing literature that has established the relation of ad evaluation and subsequent purchase behavior, study of ad evaluation effects has stimulated relatively little interest in prevention circles. In light of the relative ineffectiveness of many mass media drug prevention campaigns (Crano et al., in press; Hornik, Jacobsohn, Orwin, Piesse, & Kalton, 2008), it would seem imperative for behavioral scientists exploring pro-social media to attend to the content and structural aspects of prevention messages. A focus on ad evaluation provides an entry point into such examinations. If it can be established that people's evaluations of ads deployed in prevention campaigns are associated with the advocated or proscribed intentions or behaviors, then researchers can programmatically investigate message features associated with positive evaluations (Fishbein et al., 2002; Kang, Cappella, & Fishbein, 2006; Sayeed, Fishbein, Hornik, Cappella, & Ahern, 2005; Strasser et al., 2009), and use this information in design of persuasive communications.

Ad evaluation in marketing

In the advertising and marketing literatures, ad evaluation has received considerable attention via the construct, *attitude toward the ad* (A_{ad}). A_{ad} is an affective construct (or attitude) embodying people's feelings of favorability toward an advertisement (MacKenzie, Lutz, & Belch, 1986; Mitchell & Olson, 1981; Shimp, 1981). A_{ad} is affected by many factors, including ad exposure (Burke & Edell, 1986), message involvement (Park & Young, 1986), message quality and content (Burton & Lichtenstein, 1988; Hastak & Olson, 1989), and various cognitive (Hastak & Olson, 1989) and affective responses (Batra & Ray, 1986; Burke & Edell, 1989) elicited by the ad (Biehal, Stephens, & Curlo, 1992). Considerable attention has been directed toward A_{ad} as a construct that may mediate purchase (i.e., behavioral) intentions (Homer, 1990).

This research finds that positive A_{ad} plays a pivotal role in the success of persuasive attempts. A_{ad} has been shown to have a significant influence on purchase intentions (Batra & Ray, 1986; MacKenzie, et al., 1986; Mitchell & Olson, 1981; Walker & Dubitsky, 1994), brand choice (Biehal, et al., 1992), and brand choice over time (Shimp & Jokum, 1982). Moreover, A_{ad} explains more variance in purchase intentions than beliefs about product attributes (Mitchell & Olson, 1981) or product preference(s) (Shimp & Yokum, 1980). Studies on ad irritation (Chakrabarty & Yelkur, 2005) and offensive ads (Beard, 2008) navigate similar territory and suggest similar effects. These findings imply that research on ad evaluation in pro-social prevention contexts may prove a valuable addition to prevention efforts.

Substance use status

Identifying adolescents' vulnerability to drug initiation may prove an important step in maximizing benefits derived from scarce prevention resources (Crano & Burgoon, 2002; Crano, et al., in press; Crano, Siegel, Alvaro, & Patel, 2007; Fishbein et al., 2002). Some have attempted to identify youth at greatest risk for drug initiation by parsing the heterogeneous group of nonusers (McCusker, Roberts, Douthwaite, & Williams, 1995; Siegel, Alvaro, & M. Burgoon, 2003; Wakefield, Germain, Durkin, & Henriksen, 2006). These studies have demonstrated important systematic differences between those who are *certain* they will not use a given substance and those who are unsure of their continued abstinence. In recent research, those who were certain of that they would continue to resist marijuana usage – *resolute nonusers* – were significantly less likely to initiate usage than *vulnerable nonusers*, abstinent respondents who were uncertain that they would maintain this status (Crano, Siegel, et al., 2008). Variations of this classification model have been used to predict initiation and use of tobacco (Siegel, Alvaro, & Burgoon, 2003; Wakefield et al., 2006), ecstasy (McMillan, Sherlock, & Conner, 2003), and inhalants (Crano, Gilbert, Alvaro, & Siegel, 2008; Crano et al., 2007).

This study was designed to examine the relationship between respondents' evaluations of marijuana prevention ads, their intentions to use marijuana, and their subsequent marijuana use after accounting for current usage status. We hypothesize that respondents who evaluate anti-marijuana ads favorably will be less likely to intend to use the substance (H1) and less

likely to initiate usage one year later (H2). Further, we expect this negative association to be least apparent among resolute non-users (vs. vulnerable nonusers and users) (H3), insofar as most resolute nonusers are expected to evaluate almost all anti-marijuana ads positively, thereby attenuating the predictive validity of A_{ad} .

Method

Overview and Procedures

Data for this secondary analysis were collected and archived in the National Survey of Parents and Youth (NSPY), a four-year panel survey conducted in concert with the National Youth Anti-drug Media Campaign (<http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/27868/detail>). The sampling methodology was comprehensive and designed to develop a nationally representative sample (Crano, Siegel, et al., 2008; NIDA, 2006). Non-sensitive data were collected via computer-assisted personal interviews. For sensitive data (drug-relevant perceptions and behaviors), an audio computer-assisted self-administered interviewing method was used: respondents completed items privately using headphones and touch-sensitive screens. Respondents were interviewed four consecutive times, at approximately yearly intervals, from November 1999 to June 2004 and received \$20 for each interview. Questions assessed campaign exposure, and beliefs, attitudes, intentions, and behaviors regarding drug use and factors associated with use. Of special relevance to present concerns, measures of cued ad recall and ad evaluations were collected at each of the four yearly measurement rounds. In this research, we examined respondents' evaluations of ads at the first measurement round (T1), and associated these evaluations with intentions to use marijuana and with actual marijuana use one year later at the second measurement round (T2).

There were a dozen English-language ads evaluated by at least two hundred individuals at T1. These represented a number of general ad types: celebrity testimonials, refusal skills, alternatives to drugs, physical harms of use, etc (see Appendix A). As the goal of this study is to examine the value of ad evaluation as a general predictor of use intentions and use, analyses by ad type are beyond the scope of this study. Moreover, the limited number of exemplars for any one ad type in the initial campaign year hampers such analyses and subsequent interpretations.

Respondents

Only respondents with complete data on the main dependent variables (ad evaluations, intentions to use marijuana and marijuana use) were included in the analyses. There were 2993 respondents (1520 males) satisfying these criteria at T1 and T2; 5340 ad evaluations were available for analysis. Those respondents who were removed from the analyses due to missing data on the main dependent variables did not significantly differ from those in the sample on the main independent variables (user status, ad evaluation, and attitudes). Due to the analyses being conducted in the HLM program national weights could not be applied to the data. The ages of respondents ranged from 12-18 with a mean age of 15.06 ($SD = 1.57$). There were 2006 Caucasian, 467 African American, 403 Hispanic, and 117 Asian respondents. Age was entered as a covariate in the analyses below because age is

significantly related to both intentions ($p < .001$) and use ($p < .001$), however, ethnicity was not included as a covariate because it is not significantly associated with intentions ($p > .10$) or use ($p > .10$).

Measures

Marijuana ad evaluations—Respondents evaluated from one to five television ads in the T1 evaluation session, number of ads viewed was not significantly related to intentions to use marijuana ($r = -.01, p = .48$) or marijuana use ($r = -.02, p = .21$), however, it was significantly related with evaluation score ($r = .08, p < .001$) and will be included in the evaluation analysis below as a covariate, but not the analyses on intentions and marijuana use. All ads had been used in the Campaign. Three items were used to indicate subjects' evaluations of each ad: "This ad got my attention," "This ad was convincing," and "This ad said something important to me." Response alternatives ranged from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), $\alpha = .85$. The three item scores were averaged to create a single item for the respondent's evaluation of a particular ad, and were used as input in a multilevel linear analysis, which allowed all data to be used even though subjects viewed different numbers of ads. Therefore, respondents' evaluations of each ad they saw were included in the analyses and we did not average their ad evaluations precluding any issues with ad evaluation agreement.

Marijuana user status—Two T1 items were used to classify youth into one of three mutually exclusive marijuana use categories. Respondents were asked, "Have you ever, even once, used marijuana?" Affirmative respondents were categorized as users ($N = 382$). Remaining respondents were asked, "How likely is it that you will use marijuana, even once or twice, over the next 12 months?" They selected from: *I definitely will not*; *I probably will not*; *I probably will*; *I definitely will*. Nonusers selecting *I definitely will not* were categorized as resolute nonusers ($N = 2308$). All others were categorized as vulnerable nonusers ($N = 303$). Validity of the classification scheme has been supported in earlier research (e.g., Crano et al., 2008).

Attitude toward marijuana—Two items from T1 were averaged to develop a measure of respondents' attitudes toward marijuana use: "Your using marijuana, even once or twice, or the next 12 months, would be?" 1 (*extremely bad*) to 7 (*extremely good*) and 1 (*extremely unenjoyable*) to 7 (*extremely enjoyable*), $\alpha = .61, r = .63, p < .001$.

Marijuana intentions—At T2, respondents indicated their intention to use marijuana with the following question; "How likely is it that you will use marijuana, at least once or twice, over the next 12 months" 1 (*I definitely will not*) to 4 (*I definitely will*).

Marijuana use—Marijuana usage also was measured at T2. Participants were asked "Have you ever, even once, smoked marijuana?" Those responding yes were asked, "How long has it been since you last smoked marijuana?" Respondents answering *no* on the first item received a score of 1; other answers were scored as follows: 2 (*yes, more than 12 months ago*), 3 (*yes, more than 30 days but within the last 12 months*), or 4 (*yes, during the last 30*

days). Validity of this approach has been supported in earlier research (e.g., Crano et al., 2008)

Results

Subjects' evaluations of each of the ads they rated were used as input in a multilevel linear modeling analysis. Their ad evaluations at T1, and their intentions and actual marijuana use at T2, were measured at the individual level (the lowest level in the analysis); age, gender, attitudes toward marijuana, and user status were measured at the second level. Evaluations were nested in adolescents, so the HLM2 model in HLM 7 (<http://www.ssicentral.com/>) was used for all analyses (Raudenbush & Bryk, 2002). HLM2 is used when there are two levels of analysis, with the typical example being students nested with schools. For our analyses we have evaluations nested within respondents (2 levels of analysis) making the HLM2 the correct model for our studies analyses, see the SSI website for more detailed explanations of the models in HLM.

Ad evaluations (A_{ad})

A multi-level hierarchical linear modeling (HLM) analysis was conducted on ad evaluations, controlling for respondents' attitudes toward marijuana, number of ads viewed, age, and gender; user status was the independent variable. The analysis revealed that all predictors were significantly associated with ad evaluations (A_{ad}) at T1. Older respondents were less favorably disposed to the ads ($\beta = -.130, t = -6.00, p < .001$), the more ads that the respondents viewed were associated with more positive evaluations ($\beta = .088, t = 3.96, p < .001$) and females evaluated the ads more positively than males ($\beta = -.087, t = -5.68, p < .001$). Positive marijuana attitudes were associated with less positive ad evaluations ($\beta = -.247, t = 10.87, p < .001$).

In addition to the statistically significant covariates, a significant main effect of the independent variable, user status, was discovered: resolute nonusers evaluated the ads more positively than vulnerable nonusers ($\beta = .085, t = 4.84, p < .001$), and users ($\beta = .058, t = 2.79, p = .005$). Users' and vulnerable nonusers' evaluations did not differ significantly ($\beta = .021, t = .56, p = .579$), see Table 1 for means and standard deviations of ad evaluation for each user status group.

Two additional sets of multi-level analyses then were conducted. The first dealt with the predictive association of T1 ad evaluations and T2 *intentions* to use marijuana. The second was focused on the association of T1 ad evaluations with marijuana *use* at T2. There were two independent variables in each set of analyses (T1 ad evaluations and user status), three covariates (T1 attitudes toward marijuana, age, and gender), and one dependent measure (intentions to use marijuana in the first analysis, and actual marijuana use in the second) assessed at T2. The first analysis (model 1) in each set tested the main effects of user status and ad evaluation on the dependent measure after controlling for respondents' T1 attitudes toward marijuana, age, and gender. The second analysis (model 2) in each set tested the interaction of ad evaluation with user status on the dependent measures, controlling for the three covariates.

Intentions to Use Marijuana at T2

A summary of the models fitted on intentions to use marijuana at T2 is presented in Table 2. Examination of variables in model 1 shows that respondents' T1 attitudes toward marijuana, user status, and ad evaluations were significantly associated with their T2 intentions to use the drug. More positive attitudes toward marijuana were associated with later intentions to use the substance. The significant main effect for user status indicated that users' T2 intentions to use marijuana were significantly greater than those of resolute nonusers and vulnerable nonusers; further, vulnerable nonusers' intentions were significantly greater than resolute nonusers'. Finally, the analysis revealed a statistically significant negative association between ad evaluations at T1 and usage intentions at T2 such that more positive ad evaluation was associated with lower usage intentions. This result was found even after respondents were equated on age, gender, and T1 attitudes toward marijuana.

User status Interaction—The relationship between ad evaluation and intention was not the same for all user groups, and Model 2 was estimated to test differences among them. Analysis revealed a statistically significant interaction of ad evaluation with user status (Figure 1). Examination revealed that the simple slopes associating ad evaluation with later intentions were not statistically significant for resolute or vulnerable nonusers. However, the slope was statistically significant for users. The analysis revealed a significant association between ad evaluation and later intentions to use marijuana only for those who had reported marijuana use at T1. In short, more positive ad evaluation was associated with lower intentions to use marijuana. This result held even after equating respondents on age, gender, and marijuana attitudes.

Marijuana Use at T2

Table 3 summarizes the models fitted on marijuana use at T2. The analysis revealed that respondents' attitudes toward marijuana, age, user status, and ad evaluation at T1 were significantly associated with marijuana use at T2: older respondents showed greater marijuana use, and the more positive respondents' attitudes toward marijuana at T1, the more likely were they to use it in the next year. The user status main effect revealed that users at T1 utilized marijuana at significantly higher levels at T2 than vulnerable or resolute nonusers. Furthermore, respondents classed as vulnerable nonusers at T1 were significantly more likely than resolute nonusers to initiate later usage, see Table 1 for means and standard deviations of marijuana use for each user status group. Ad evaluation also was significantly associated with usage. Evaluations of ads in T1 were significantly, and negatively, associated with usage at T2; more positive ad evaluations at T1 were associated with less marijuana use at T2.

User status Interaction—Model 2 revealed a statistically significant interaction between T1 evaluation and user status on marijuana usage at T2 (Figure 2). Examination revealed that the simple slopes of the associations between ad evaluations and marijuana use were not statistically significant for vulnerable or resolute nonusers. However, for users, the slope indicated a statistically significant association between ad evaluations and less marijuana usage in the next year, even after respondents were matched statistically on age, gender, and

attitudes toward marijuana. Among the users, positive ad evaluation at T1 was associated with reduced use of marijuana at T2.

Discussion

The results of this investigation reinforce findings from the commercial marketing literature, which suggest that A_{ad} is a facilitative factor in media-based persuasion (Batra & Ray, 1986; Walker & Dubitsky, 1994). It makes sense that positively evaluated communications would produce sought-for responses in intentions and message (or product) acceptance. Our study suggests that this relation holds as well in the context of drug prevention—at least where adolescent marijuana users are concerned.

Analysis showed that results involving the background variables – gender and age – were consistent with earlier research (Crano et al., 2008). Older respondents were significantly more likely to intend to use marijuana, and more likely to do so. No differences were associated with gender. In addition, A_{ad} predicted marijuana usage intentions and actual use one year after it was measured. Respondents' intentions and behaviors were significantly associated with variations in their ad appraisals. However, this relation was not as straightforward as might be imagined. The major effects of A_{ad} were found in the subgroup of respondents who had already initiated marijuana use at T1. Among these respondents, positive ad evaluations were followed one year later by reductions in both intentions to use, and actual use of, marijuana. This lagged relation cannot be interpreted causally, as the respondents were not assigned randomly to ad conditions designed to elicit positive or negative reactions, but neither should the possibility that A_{ad} had an effect on later marijuana usage intentions and behavior be dismissed. At a minimum, the results call for research that allows for an unambiguous experimental analysis of the effects of manipulated ad effects on A_{ad} on intentions and usage, with subjects from different points along the marijuana use continuum. The results also point strongly to the likely critical importance of understanding the features of ads that differentially appeal to targets distinguished on the basis of prior usage behavior, current attitudes, and intentions.

Taken as a whole, the results provide provocative insights into the meaning of the negative results found in analyses of the National Youth Anti-drug Media Campaign, which suggested the Campaign failed to achieve the goal of modifying marijuana use among at-risk youth (or vulnerable nonusers, to use our term) (Hornik, et al., 2008; Scheier & Grenard, 2010). Understanding why it failed is critically important. The Campaign's reach was extraordinary. However, as research on the A_{ad} construct has shown, reach alone is not sufficient to guarantee positive persuasive outcomes. At least as crucial as exposure are targets' evaluations of the ads used in the persuasive campaign.

The analyses indicated that not all respondents evaluated the ads equally favorably. Those most in need, the respondents who reported usage at the T1 measure, liked the ads the least. Those on the fence, the vulnerable nonusers, who by definition were contemplating use, liked the ads significantly less than those youth who expressed a resolute opposition to usage, and did not differ from users in their A_{ad} ratings. Thus, the Campaign's ads were least liked by those most in need of help in stopping marijuana use or avoiding initiation. That

resolute nonusers were most positively inclined to the ads may be taken as encouraging, but this is not a new result: prior research has shown that resolute nonusers are uniformly more open to anti-drug messages of all types than vulnerable nonusers or users (Crano et al., 2007).

The cost of failure to appeal to those most in need can be gauged in the analyses of respondents' marijuana intentions and actual usage in the second year of the study. As expected on the basis of prior investigations, ad evaluations were significantly and inversely related to usage intentions, and to actual use. The most counterintuitive result, however, was found in the interaction of user status with A_{ad} on both intentions (Model 2, Table 2) and use (Model 2, Table 3). The analyses showed that attitudes toward the Campaign's anti-marijuana ads (assessed at T1) significantly predicted marijuana intentions and use at the second session, but only for users. Users who admitted liking the ads were less likely than users who did not to continue to use into the second year, even after attitudes toward marijuana were equated between the groups. Among resolute nonusers, A_{ad} did *not* predict later intentions or use, probably because variation in A_{ad} was constrained in this group, the most favorably inclined to the ads in the first place. For this group, predictive validity of A_{ad} was not great owing to respondents' general openness to the ads. This result suggests that the massive Campaign did not necessarily fail. An interpretation consistent with the findings suggests it might have had a positive effect among users who liked the Campaign's ads. This association was statistically significant even after accounting for effects of respondents' age, gender, and T1 attitudes toward marijuana. We realize this causal inference cannot be made confidently, given the limitations of the research design, but at a minimum it points to an opportunity that might have been missed. More attention to ad design could have ameliorated the iatrogenic effects reported in evaluations of the Campaign (Hornik et al., 2008).

Limitations

The most serious limitation of the research results from its quasi-experimental nature, which necessarily constrains the extent to which causal inferences may be drawn. The standard warning that correlation does not necessarily imply causation is well taken, and important, but the opposite side of the coin also should be considered, namely that causation *necessarily* implies correlation (Crano & Brewer, 2002). On the positive side of the ledger, the analysis was based on a nationally representative sample of youth, tied to one of the largest mass mediated drug prevention programs ever launched in the US. Using a dataset of this scope lends generalizability to the results of the study that research involving more limited samples is unlikely to attain. The secondary analytic nature of the study thus imposes some limitations, but it also provides important benefits.

A second issue that might be raised has to do with the classification system used to differentiate respondents. In the case of the nonuser groups, the classification is reasonably straightforward, but the user group could include habitual users of marijuana along with those who experimented once or twice then discontinued use. These individuals are surely different, but they cannot be differentiated by the classification scheme imposed by the secondary nature of the data. To try to offset this problem, we assessed respondents'

attitudes toward marijuana, and used this variable as a covariate in all analyses. It seems reasonable to assume that the attitudes of those who experimented with marijuana and quit after a few exposures would differ from those of habitual users.

Future directions

The next step that logically follows from these findings is to isolate specific ad features that appealed to individuals who fell along different points of the marijuana user continuum. Are there features of ads that particularly appeal to users, resolute nonusers, or vulnerable nonusers? If so, it stands to reason that we would design ads that make use of these features to target specific audiences. Communication scholars have made some inroads into this issue (Kang, Cappella, & Fishbein, 2009; Strasser, et al., 2009; Yzer, Vohs, Luciana, Cuthbert, & MacDonald, 2011); much of this research has been concerned with receivers' emotional responses to ads, but even in this area, much remains to be done. Yzer and colleagues (2011), for example, have shown important relations between adolescents' affective responses to anti-drug ads and their judgments of the ads effectiveness, and Dillard and colleagues have focused considerable attention on perceived ad effectiveness as an indicator of actual ad effectiveness, which could inform researchers and practitioners in the pre-implementation phase of persuasion campaigns (Dillard, Shen, & Vail, 2007; Dillard, Weber, & Vail, 2007).

The research we reported suggests a complementary approach, in which respondents' attitudes toward the ads (A_{ad}) are assessed directly, rather than, or in addition to, subjects' judgments of the ads' effectiveness. In both approaches, the logical next step is to determine the antecedents of these attitudes and judgments. Both approaches have much to offer, and we are hopeful that the present research will provide added impetus to pursue this issue. Such research may pay great dividends in the development of communications designed to prevent the use of dangerous drugs.

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APPENDIX A: Description of campaign ads used in study

Blige

R&B singer Mary J Blige gives a monologue speaking about her previous drug use. She suggests accepting oneself and loving oneself is a way of avoiding drug use.

Brothers

A teenage boy and his younger brother engage in various activities (e.g., playing basketball, eating hotdogs). The older brother smokes some marijuana; his little brother sees him.

Drawing

The ad starts off as a cartoon with the main character drawing his own way out of confrontation with two bigger teenaged drug-using characters. At the end of the ad, the camera pans back to show an adolescent aged male who says his anti-drug is drawing.

Drugskil

Tennis star Venus Williams is practicing tennis and delivering a monologue. She talks about how she dreamed of being a tennis champion when she was a child and she had to work very hard to achieve her dream. She says that “drugs kill dreams”.

Hockey

A teenage boy is playing hockey without protective gear; the ad is fast-paced and contains many cuts. The narrator says that “smoking weed is kind of like playing hockey without your gear” and “don't take a hit you're not ready for”.

Howtosay

Various young people use dramatic ways to say no to drugs.

Music

A cartoon character walks the streets with headphones on. Various aliens attempt to offer it drugs and the music coming out the character's headphones destroy the aliens. At the end of the ad an adolescent boy is shown and says “My name is Alberto and my anti-drug is music.

Nothanks

A group of adolescents are at a party. A young man repeatedly enters a room where a group of his friends are smoking marijuana. In the different scenes, the young man uses different strategies to say no to smoking marijuana.

Okpass2

A group of adolescents are socializing. A young male arrives, takes out a joint, and passes it. Each person in the group passes it—unlit. It gets back to the young male who puts it back in his pocket. The tagline at the end says “friends: the anti-drug.”

Soccer

Professional and amateur women and girls play soccer. Various people talk to the camera about how now is a great time to be a girl. At the end there is a tagline that says “opportunity: the anti-drug.”

Tara

Professional figure skater Tara Lipinski and various adolescent girls talk about past female sports stars; sometimes we see scenes of these stars, other times the actors hold up their pictures. At the end a tagline reads “opportunity: the anti-drug.”

Whatneed

An older male walks up to the camera and asks “hey man, what you need”. An adolescent male responds “I need.” followed by various statements (e.g., a future, a job, to have fun). The narrator at the end of the ad says “next time a pusher asks you what you need, let him know.”

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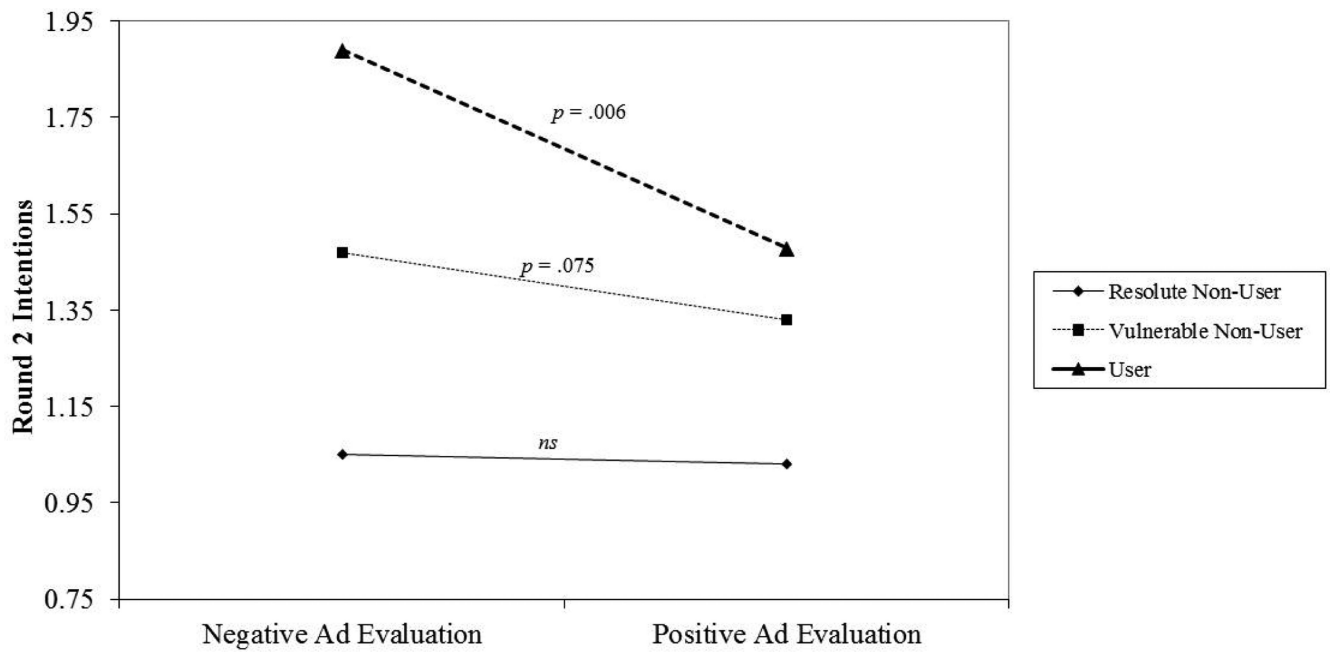


Figure 1.
Simple slopes for the interaction between user status and PSA evaluation on intentions to use marijuana at Round 2.

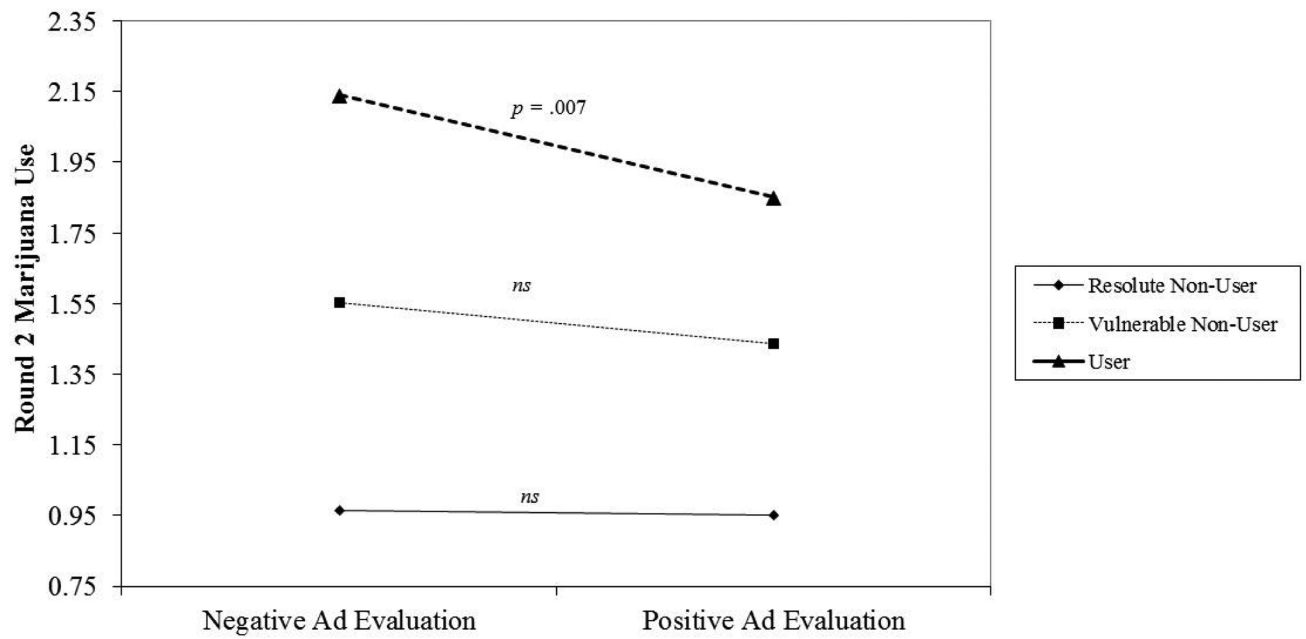


Figure 2.
Simple slopes for the interaction between user status and PSA evaluation on marijuana use at Round 2.

Table 1

Means and standard deviations of ad evaluation and marijuana use by user status.

User Status at T1	Ad Evaluation at T1		Use at T2	
	<i>M</i>	<i>Sd</i>	<i>M</i>	<i>Sd</i>
Resolute non_users (<i>N</i> = 2308)	4.00	0.83	1.20	0.65
Vulnerable non-user (<i>N</i> = 303)	3.50	0.87	1.88	1.15
Users (<i>N</i> = 382)	3.33	1.03	2.95	1.00

Notes. T1 = measured during first year of data collection, T2 = measured during second year of data collection. Use at T2 was coded 1= no lifetime use, 2 = used marijuana more than 12 months ago, 3 = used marijuana within last year but more than 1 month ago, and 4 = used marijuana within past month. Higher Ad Evaluation scores reflect more positive ad evaluation.

T2

HLM model of Intentions to Use Marijuana at Round 2

	Intentions to Use Marijuana			
	Model 1		Model 2	
	β	t	β	t
Ad Evaluation	-0.050	-3.02**	-0.034	-2.25*
Status R vs. V	0.194	8.30***	0.186	7.74**
Status R vs. U	0.324	10.74***	0.295	9.75***
Status V vs. U	0.255	4.55***	0.224	3.92***
Attitude toward marijuana	0.231	7.67***	0.216	7.13***
Age	0.016	0.68	0.019	0.83
Gender	0.009	0.51	0.008	0.479
Interaction			-0.071	-3.92***
Resolute			-0.012	-0.69
Vulnerable			-0.087	-1.79 \dagger
User			-0.128	-2.78**

Notes. R = resolute non-user, V = vulnerable non-user, U = user, N = 5340 at level 1, N = 2993 at level 2

\dagger
p < .01

*
p < .05

**
p < .01

p < .001

Table 3

HLM model of Marijuana Use at Round 2

	Marijuana Use			
	Model 1		Model 2	
	β	t	β	t
Ad Evaluation	-0.031	-2.02 *	-0.023	-1.52
Status R vs. V	0.175	6.82 ***	0.177	6.55 ***
Status R vs. U	0.498	19.83 ***	0.484	18.72 ***
Status V vs. U	0.531	10.39 ***	0.504	9.26 ***
Attitude toward marijuana	0.143	5.34 ***	0.136	5.02 ***
Age	0.102	4.58 ***	0.104	4.66 ***
Gender	-0.011	-0.66	-0.011	-0.68
Interaction			-0.037	-2.65 **
Resolute			-0.018	-1.06
Vulnerable			-0.024	-0.48
User			-0.111	-2.73 **

Notes. R = resolute non-user, V = vulnerable non-user, U = user, N = 5340 at level 1, N = 2993 at level 2

*
p < .05**
p < .01***
p < .001