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Adolescents' Media-related Cognitions and Substance Use in the Context of Parental and Peer Influences

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Abstract

Two cross-sectional studies investigated media influences on adolescents' substance use and intentions to use substances in the context of exposure to parental and peer risk and protective factors. A total of 729 middle school students (n = 351, 59% female in Study 1; n = 378, 43% female in Study 2) completed self-report questionnaires. The sample in Study 1 was primarily African-American (52%) and the sample in Study 2 was primarily Caucasian (63%). Across the two studies, blocks of media-related cognitions made unique contributions to the prediction of adolescents' current substance use and intentions to use substances in the future above and beyond self-reported peer and parental influences. Specifically, identification with and perceived similarity to media messages were positively associated with adolescents' current substance use and intentions to use substances in the future, and critical thinking about media messages and media message deconstruction skills were negatively associated with adolescents' intention to use substances in the future. Further, peer influence variables (e.g., peer pressure, social norms, peer substance use) acted as risk factors, and for the most part, parental influence variables (e.g., parental pressure to not use, perceived parental reaction) acted as protective factors. These findings highlight the importance of developing an increased understanding of the role of media messages and media literacy education in the prevention of substance use behaviors in adolescence.

Keywords

Substance use; Media; Intentions to use; Identification; Critical thinking; Adolescents; Parents; Peers

Introduction

Although adolescents' use of illegal substances has been declining overall in the past few years, the rates of experimentation remain alarmingly high. For example, in 2008, close to three-quarters of all twelfth grade students reported trying an alcoholic beverage sometime in their life (72%) and close to half have reported trying cigarettes (45%) or another illicit

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drug (47%; Johnston et al. 2008). Furthermore, at least one in five students has used a substance in the last 30 days (i.e., alcohol 43%; cigarettes 20%; and other illicit drugs 22%). Thus, although there has been some progress in preventing the use of substances by adolescents, there is still much ground to cover.

Adolescent substance use places millions of teenagers at increased risk for a range of negative outcomes. Commonly described consequences of adolescent substance use include juvenile delinquency (D'Amico et al. 2008), automobile accidents (NHTSA 2006), and risky sexual behaviors (Cooper and Orcutt 1997). Furthermore, neuropsychological research has revealed that experimenting with substances in adolescence can change the structure and function of the developing brain (e.g., alcohol, Brown et al. 2000; marijuana, Jacobus et al. 2009; nicotine, Jacobsen et al. 2007). Given the high rates and negative consequences of adolescent substance use, it is important to understand the myriad influences that may affect adolescents' choice to use substances in order to better inform the content and methods of preventive intervention programs.

The ecological perspective developed by Bronfenbrenner (1979) provides a broad perspective for considering multiple influences simultaneously and suggests that children develop in a multilevel system with dynamic developmental contextual influences that interact with the child and with one another. Consistent with the microsystem level in the ecological perspective, peers and parents directly influence adolescent substance use behaviors and these findings have been well-documented in concurrent and longitudinal studies (Kung and Farrell 2000; Hawkins et al. 1992). In addition to the consideration of proximal, interpersonal influences on substance use behaviors, Bronfenbrenner's model suggests the importance of studying and understanding other more distal sources of influence on children's behavior that are derived from the broader culture and society, like settings contained within the exosystem level. For example, adolescents exist in a media-rich, if not media-saturated, environment that broadens the peer network to include a virtual peer system that is a powerful source of both normative information and messages about social and personal success. Despite the immersion of youth in a media world, relatively less is known about the impact of media influences on adolescents' cognitions about substance use than what is known about parental and peer influences (e.g., Johnson and Johnson 2001; Hoffman et al. 2006). Thus, the main purpose of the studies presented in this article was to examine the influence of media-related cognitions on substance use in the context of peer and parental influences.

Peer Influence

Peer influence has been found to be a potent risk factor and predictor of adolescent substance use, and this influence, both directly and indirectly, has been associated with both current and future substance use behaviors (Hawkins et al. 1992). The mechanisms of peer influence on substance use can be exerted in a number of ways. First, peers may influence one another *directly* through positive and negative peer pressure to use substances. In fact, peer pressure is perhaps the most frequently discussed risk factor for early substance use, and studies of middle school youth have found positive associations between smoking and drinking related to direct peer pressure (Kung and Farrell 2000; Simons-Morton et al. 2001). Second, peers may influence one another *indirectly* through observational learning processes that are manifested by simply associating with valued peers who use illegal substances. Also, beliefs about social norms regarding substance use are transmitted through relationships with valued peers who use illegal substances. In general, peer use of substances is one of the strongest predictors of substance use among youth (Barnes and Welte 1986). When adolescents associate with peers who use drugs, they are much more likely to initiate use themselves (Huizinga et al. 1995). Peer groups also share information, attitudes, values, and norms about drug use, thus providing a social context for drug use (Oetting and

Beauvais 1986). In the current study, we investigated four peer influence factors on substance use that examined both direct and indirect influences including association with peers who use alcohol or tobacco, direct peer pressure not to use, direct peer pressure to use, and perceptions of social norms of the prevalence of peer alcohol or tobacco use.

Parental Influence

Although adolescence constitutes a time of increased peer influence, parents still have a significant effect on adolescents' substance use (e.g., Kung and Farrell 2000; Steinberg et al. 1994). In fact, parenting practices have been found to moderate the relationship between peer pressure and drug use, suggesting that better parenting can serve as a protective factor for youth against initiation of early illegal substance use. For example, the relationship between peer influence and drug use was stronger for young adolescents who experienced low quality parenting in comparison to adolescents who experienced high quality parenting (Kung and Farrell 2000). Parents may reduce an adolescent's risk of substance use through several avenues, including but not limited to: providing positive modeling and reinforcement of appropriate behaviors, monitoring of the adolescent's environment, maintaining positive attitudes and self-efficacy about discussing substance use, and establishing positive norms and expectations about substance use (Webb et al. 1996; Simons-Morton and Haynie 2003; Barnes and Farrell 1992; Brown et al. 1987; Cohen and Richardson 1994; Harakeh et al. 2004; Kodl and Mermelstein 2004). In addition to parents' providing these protective influences, parental attitudes and behaviors also have the potential to increase the likelihood that their adolescent will use substances through mechanisms such as parental modeling of negative substance use behaviors (Hops et al. 1996). The current study included the examination of three parental influence factors on adolescent substance use: those factors included parental use of alcohol or tobacco, direct parental pressure to not use alcohol or tobacco, and perceived parental reactions to the potential of adolescent alcohol or tobacco use.

Media Influence

Mass media are becoming increasingly important environmental contexts and influences in the lives of young people. For example, children and adolescents in the U.S. spend an average of almost 8.5 h per day engaged in media-related activities, such as watching television, listening to music, using a computer, or playing video games (Rideout et al. 2005). This high level of exposure to a wide range of media messages leaves youth vulnerable to pro-substance use messages that have inundated many media outlets. For example, over 70% of teens aged 12–17 were exposed to advertisements for eight of the top ten cigarette brands five or more times in a year (Center for Tobacco Free Kids 2000). In addition, positive references to drugs, both legal and illegal, and depictions of substance use are not confined to advertising. In fact, studies of television have found that 20% of prime-time television episodes mentioned illicit drugs, 19% showed characters using tobacco, and 71% showed the consumption of alcohol, including 65% of popular teen episodes showing alcohol use (Christenson et al. 2000). In addition, adolescents are exposed to approximately 84 explicit substance use references every day in popular music (Primack et al. 2008). These trends in youth's exposure suggest that media messages about alcohol, tobacco, and other drugs are pervasive in the lives of adolescents.

Unfortunately, not only are messages surrounding alcohol and tobacco products pervasive, they are also persuasive. The association between youth's exposure to pro-drug media messages and substance use (e.g., tobacco and alcohol use) is well-documented (Strasburger and Donnerstein 1999). Positive correlations have been reported between advertising exposure and: (1) adolescent drinking, (2) intentions to drink among adolescent non-drinkers, (3) excessive consumption, and (4) drinking while driving (Atkin et al. 1983,

1984). For example, middle school students who reported greater exposure to alcohol advertising were significantly more likely to drink alcohol in high school than those who reported less exposure (Ellickson et al. 2005). Further, the most heavily advertised beer brands have the highest brand awareness, brand usage, brand preference, and brand loyalty among junior and senior high school students (Gentile et al. 2001). Thus, it is clear that the advertising of alcohol and tobacco is strongly linked to adolescent experimentation.

Substance use behaviors as seen and heard in media outlets other than advertising have also been linked to youth experimentation. Young people who viewed more than 5 h of TV per day were almost 6 times as likely to begin smoking than youth who viewed <2 h (Gidwani et al. 2002). In fact, the more ninth graders viewed television and music videos, the more likely they were to begin the use of alcohol within the next 18 months (Robinson et al. 1998). A longitudinal study of adolescents found that viewing smoking in movies acted as a strong predictor to adolescents' initiating smoking 13−26 months after the initial survey. As the exposure increased, so did the effect on smoking initiation (Dalton et al. 2003). Another study revealed that smoking by stars in movies viewed by adolescent girls who have never smoked significantly increased the risk of future smoking (Distefan et al. 2004). One study conducted on middle school students found that, over a 2-year period, those adolescents who had been exposed to movies with alcohol featured were significantly more likely to being using alcohol at an earlier age, even after controlling for demographic characteristics (Sargent et al. 2006). Thus, exposure to persuasive media messages about substances are not innocuous and may be related to serious health outcomes.

Current Studies

Two studies were conducted to investigate the three influences of parents, peers, and media messages on middle school students' current and future substance use. The main goal of Study 1 was to examine the unique influence of media-related cognitions on adolescents' current substance use and intentions to use substances in the future, controlling for parental and peer influences. The goals of Study 2 were to replicate the findings from Study 1 regarding the importance of media influence and to conduct a more in-depth investigation of a wider range of media-related cognitions as predictors of current and future substance use.

Study 1

A conceptual framework, the Message Interpretation Process (MIP) Model (Austin and Johnson 1997a, b; Austin and Meili 1994), was developed in the health communications field for understanding possible cognitive mediators that may explain the relationship between media exposure and behavioral choices, in general, and substance use behavioral choices, in particular. This framework describes the hypothesized process of how a media message is internalized. Internalization is based upon how realistic the media message seems (i.e., perceived realism), the extent to which the media message represents the individual's own life experiences (i.e., perceived similarity), and the attractiveness of the media message (i.e., perceived desirability). All three of these interpretations of a media message are hypothesized as influencing decision-making. These components work together to contribute to the degree to which the viewer identifies with, or wishes to emulate, the behaviors endorsed in the media message. For example, if an adolescent views an alcohol commercial that seems realistic, includes actors who are similar in age or appearance to the viewer, and also contains extremely attractive models (either in terms of their physical attractiveness or the attractiveness of what the model is doing), then the adolescent would be more likely to identify with the behaviors promoted in the advertisement. The model predicts that identification with the media message directly informs the viewer's expectancies regarding the behaviors being endorsed. In other words, if the viewer

positively identifies with the media message, then the viewer would have positive expectancies regarding the endorsed behaviors and vice versa. Furthermore, expectancies ultimately influence the behavior of the viewer; so, in this case, if the adolescent expects that substance use will lead to a positive outcome, then he or she is more likely to use substances. These mediating cognitions of realism, desirability, and similarity were examined as the core media influence variables in Study 1.

Hypotheses

Consistent with the literature, parental and peer influences were expected to be significantly related to adolescents' cognitions about substance use. Media influences were also expected to significantly predict substance use and substance use cognitions, and the amount of variance that the block of media variables predicted was expected to be significant above and beyond the variance accounted for by peer and parental influences. Specifically, consistent with the MIP model, realism, desirability, and similarity were expected to be positively related to substance use behaviors and intentions to use substances in the future. Finally, it was hypothesized that there would be a replication of previously reported findings about the role of parental and peer influence variables as significant predictors of adolescents' substance use outcomes.

Methods

Participants—An anonymous questionnaire was administered to students from two urban middle schools from a school district that draws students from an urban/suburban/rural population in the Southeastern United States to assess their attitudes, behaviors, and cognitions surrounding parents, peers, media, and substance use. There were 22 classrooms consisting of 531 students recruited to participate in the study. Of the students who were recruited, 385 (73%) received parental permission to participate in the study with data collected from 6th (18%), 7th (47%), and 8th (35%) grade students. Students ranged in age from 11 to 16 (M = 13.3, SD = 0.92), 59% were female, 52% were African-American, 27% were Caucasian, 7% were Asian, and 14% were reported as Other. With respect to ethnicity, 4% reported that they were of Hispanic, Latino, or Spanish origin. Data from 34 participants were excluded from the analyses because they failed to complete at least 50% of the questionnaire.

Measures—Participants completed measures that assessed demographic information, as well as peer, parent, and media influences. The media influence variables were adapted from Austin and colleagues (Austin and Meili 1994; Austin and Johnson 1997a, b; i.e., desirability, realism, similarity). Mean scores were created for each scale by averaging respondents' scores on the relevant items. Each participant indicated their sex and race and these categorical variables were dummy-coded for use in the regression analyses.

Current Use of Alcohol and Tobacco (α = 0.84): Three items asked adolescents about their tobacco and alcohol use within the past 30 days. Questions included: “During the past 30 days…”, “…how many days have you used any alcohol?”, “…how many days have you used alcohol to intoxication or gotten drunk (5 or more drinks at one time)?”, “…how often did you smoke (part or all of) a cigarette?”, “…how many days did you smoke (part or all of) a cigarette?” Response scales ranged from a low of 0 to a high of 30 (frequency of use), with higher scores indicating a higher frequency of use.

Intentions to Use Alcohol and Tobacco (α = 0.82): Six items asked adolescents about their plans to use alcohol (including beer, wine and hard liquor) and tobacco (including cigarettes, chewing tobacco and snuff) as adults. Questions included: “When you are an adult, how often do you think you will…”, “…drink beer?”, “…drink wine?”, “…drink hard

liquor?", "…get drunk or drink a lot of alcohol at one time?", "…smoke cigarettes?", and "…chew tobacco?" Response scales ranged from 0 (*Never*) to 4 (*Daily*), with higher scores representing a higher intent to use alcohol and tobacco.

Positive Peer Pressure (α = 0.95): Two items measured how often adolescents are pressured by friends to not drink alcohol or smoke cigarettes. Questions included: "Do your friends pressure you to…", "…NOT drink alcohol?" and "…NOT smoke cigarettes or use other tobacco products?" Response scales ranged from 1 (*Never*) to 3 (*Very Often*), with higher scores indicating a higher degree of peer pressure to stay away from alcohol and tobacco.

Negative Peer Pressure (α = 0.89): Two items measured how often adolescents are pressured by friends to drink alcohol or smoke cigarettes. Questions include: "Do your friends pressure you to", "…drink alcohol?" and "…smoke cigarettes or use other tobacco products?" Response scales ranged from 1 (*Never*) to 3 (*Very Often*), with higher scores indicating a higher degree of peer pressure to use alcohol and tobacco.

Social Norms Regarding Alcohol and Tobacco Use (α = 0.88): Five items measured the degree to which adolescents believe that smoking and drinking are prevalent activities. Items included "Teens drink alcohol", "Friends smoke cigarettes with each other", "Parties have beer, wine, and liquor at them", "Teens smoke cigarettes", and "People smoke cigarettes or use other tobacco products at parties". Response scales ranged from 0 (*No, Never*) to 3 (*Yes, Always*), with higher scores indicating a greater belief that drinking alcohol and using tobacco are common activities.

Peer Use (α = 0.84): Four items measured how often adolescents believed their best female and male friend drank alcohol or smoked cigarettes during the past year. Questions included: "How often do you think your best female (male) friend…", "…had at least one whole drink of an alcoholic beverage during the past year?", and "…has smoked a cigarette or used another tobacco product during the past year?" Response scales ranged from 0 (*Never*) to 4 (*Daily*), with higher scores indicating the belief that his/her friends use alcohol or tobacco more often.

Parental Use (α = 0.64): Four items measured how often adolescents believed their mother/female guardian and father/male guardian drank alcohol or smoked during the past year. Questions included: "How often do you think your mother/female guardian (father/male guardian)…", "…had at least one whole drink of an alcoholic beverage during the past year?", "…has smoked a cigarette or used another tobacco product during the past year?" Response scales ranged from 0 (*Never*) to 4 (*Daily*), with higher scores indicating the belief that his/her parents use alcohol or tobacco more frequently.

Parental Pressure (α = 0.91): Four items measured the degree to which adolescents report that parents pressure them to avoid alcohol and tobacco. Questions included: "Do your parents/guardians pressure you to stay away from…", "…alcohol?", "…cigarettes or other tobacco products?", "…kids who drink alcohol?", and "…kids who smoke cigarettes?" Response scales ranged from 1 (*Never*) to 3 (*Very Often*), with higher scores indicating a higher degree of parental pressure to stay away from alcohol and tobacco.

Parental Reaction to Potential Use (α = 0.90): Four items measured how happy or unhappy adolescents believed their parents would be if they drank alcohol or used tobacco now. Questions included: "How happy or unhappy would your mother/female guardian (father/male guardian) be if you…", "…drank alcohol now?", and "…smoked cigarettes or

used other tobacco products now?" Response scales ranged from 1 (*Very Happy*) to 5 (*Very Unhappy*), with higher scores indicating the belief that his/her parents would be less happy about his/her alcohol or tobacco use.

Desirability of People in Alcohol and Tobacco Ads (α = 0.93): Eight items measured the degree to which adolescents found the people in alcohol and tobacco advertisements attractive. Adolescents rated the following statements separately for men and women: "Men/women in beer and cigarette ads seem…rich or wealthy", "…good-looking", "…popular", and "…happy or like they are having fun". Response scales ranged from 0 (*No, Never*) to 3 (*Yes, Always*), with higher scores indicating a greater belief that the people in alcohol and tobacco advertising are attractive.

Realism of Alcohol and Tobacco Ads (α = 0.85): Four items assessed the degree to which alcohol and tobacco media portrayals are like real-life people and events. Adolescents rated statements such as "People in cigarette ads do things that average people do", "People in beer ads do things that average people do", "People in beer and cigarette ads act like average people", and "People in beer and cigarette ads look like average people". Response scales ranged from 0 (*No, Never*) to 3 (*Yes, Always*), with higher scores indicating a greater belief that images in alcohol and tobacco ads are realistic or typical.

Similarity to Media Portrayals (α = 0.76): Two items asked adolescents to rate whether media portrayals are similar to their personal experiences, such as "I do the things I see on TV commercials and in magazine ads" and "I am like the people on TV commercials and magazine ads". Response scales ranged from 0 (*No, Never*) to 3 (*Yes, Always*), with higher scores representing a higher perception of similarity between media portrayals and personal experiences.

Procedure—About a week prior to the administration, project staff members distributed consent forms to send home to parents or guardians of the middle school students in each participating class. The consent form described the procedures that would be used, highlighting the anonymity of students' answers. After distributing the consent forms, staff members returned at the beginning of several consecutive class periods to collect signed parental consent forms and give out small rewards to those who returned their signed forms. The average consent rate for the study was 71.3% of participating classes.

Those students who had parental consent to participate in the study and who additionally gave written assent to participate were administered the paper-and-pencil questionnaires during a regular class period.

Results

Overview of the Analyses—This dataset included responses from adolescents clustered in classroom, within schools. Despite the nested structure, it was determined that using a mixed model design for the analyses was not warranted for two reasons. First, small between school variance was anticipated because values on the assessed variables are not likely attributable to individual schools but individual students. The schools that participated in this research project were both public schools located in the same small school district, thus there is an assumption of homogeneity between schools. Second, only two schools were sampled for this study; therefore, there is not sufficient information available to treat school as a random effect.

Variables included in the analyses had less than 6% missing data; therefore, multiple imputation ($m = 20$) using the EM algorithm (Schafer and Graham 2002; Schafer and Olsen

1998) was utilized to handle the missing data. Next, bivariate correlations were calculated between all the variables. Then, two ordered multinomial logistic regression models were conducted. Effects for both items and subjects were included in the model and standard errors were properly adjusted for multiple observations per subject. One model included the individual items that comprised the current substance use scale as the dependent variables and the other model included the individual items that comprised the intentions to use substances scale as the dependent variables. In addition, both models contained all demographic and influence variables, including grade, race, sex, peer pressure (positive and negative), social norms regarding alcohol and tobacco use, peer use of substances, parental pressure not to use substances, parental reaction regarding adolescent's substance use, parental use of substances, perceived desirability of alcohol and tobacco ads, perceived realism of alcohol and tobacco ads, and perceived similarity to media portrayals. The intentions model also contained the measure of current substance use. After conducting the overall analyses, the media variables were tested together to determine whether the block predicted a unique amount of variance in the outcome variables over and above the variance accounted for by the parental and peer influence variables.

Preliminary Analyses—Descriptive statistics (e.g., mean, standard deviations) were examined for each construct (see Table 1). A bivariate correlation was calculated for the two outcome variables, current substance use and intentions to use substances (see Table 2). It revealed a significant positive association between the two outcome variables such that the more that adolescents used alcohol and tobacco in the past 30 days, the more they intended to use substances in the future ($r = 0.34$, $p < 0.0001$). In addition, interscale correlations were calculated among the influence variables. The correlations ranged from a low of 0.00 (peer pressure to use substances and parental pressure not to use; parental use of substances and perceived realism) to a high of 0.42 (parental pressure not to use and peer pressure not to use). The average interscale correlation between pairs of influence variables was 0.16. These preliminary analyses suggest that the predictor and outcome variables, although associated, could be examined uniquely.

Main Outcome Findings: Current Substance Use—The analyses revealed that the inclusion of all the variables in the model accounted for a significant amount of variance in adolescents' alcohol or tobacco use in the past 30 days, $F(13, 192700) = 15.64$, $p < 0.0001$ (see Table 3). Specifically, factors that were related to higher levels of alcohol or tobacco use in the past 30 days were being Caucasian, being male, having a greater belief that alcohol and tobacco use are normative activities, having peers who have used substances in the past, and increased perceptions of similarity to media portrayals. Conversely, parental pressure to not use substances predicted lower levels of alcohol or tobacco use in the past 30 days. The influence variables that comprised the media block (i.e., desirability, realism, and similarity) predicted a significant amount of variance over and above the demographic, peer, and parental variables, $F(3, 259648) = 5.37$, $p > 0.001$.

Main Outcome Findings: Intentions to Use Substances—The analyses revealed that inclusion of all the variables in the model accounted for a significant amount of the variance in adolescents' intentions to use substances, $F(14, 564211) = 24.36$, $p < 0.0001$ (see Table 3). Specifically, factors that were related to higher levels of intentions to use alcohol and tobacco in the future were higher grade levels, being Caucasian, being female, previous use of alcohol or tobacco in the past 30 days, negative pressure from peers to use substances, having a greater belief that alcohol and tobacco use are normative activities, having peers who have used substances in the past, greater belief that his/her parents would be less happy about his/her alcohol or tobacco use, and increased perceptions of desirability and similarity to media portrayals. Parental pressure to not use substances predicted lower levels of

intentions to use alcohol and tobacco in the future. The influence variables that comprised the media block (i.e., desirability, realism, and similarity) were found to predict a significant amount of variance in intentions over and above the demographic, peer, and parental variables, $F(3, 281988) = 18.40$, $p < 0.0001$.

Preliminary Discussion

To our knowledge, this is the first study that has found that media-related cognitions significantly influenced self-reports of adolescents' current and future substance use behaviors even after controlling for parental and peer influences in the model. These patterns of findings suggest that there are multiple levels of influence on teens' behaviors and predictions of their own future behaviors including media messages. Overall, the findings from Study 1 revealed that the block of media-related cognitions have a unique influence on adolescent substance use behaviors and intentions above and beyond the influence of parents and peers and that, specifically, perceived similarity plays a role in explaining adolescents' current substance use and perceived desirability and similarity play roles in explaining adolescents' intentions to use substances. According to research on the MIP model (Austin and Johnson 1997a, b), both desirability and similarity contribute to an individual's level of identification with, or desire to imitate, a media portrayal. Consequently, the amount of identification with a media portrayal has been shown to be directly related to behavioral intentions. Other research has also demonstrated that perceived similarity to a model can increase the likelihood that the model's observed behaviors are imitated (Bandura 1986).

The results from Study 1 provide supportive evidence for the importance of parents and peers in predicting adolescents' current and future substance use. Specifically, parental pressure to not use substances was associated with a lower amount of substance use behaviors and a lower intent to use in the future. By communicating to adolescents that using substances is dangerous or wrong, parents may be able to shape their adolescents' beliefs about substances. Parental pressure to not use substances, which may take many forms in the family (e.g., rule setting, direct communication, or coaching), can play a beneficial role in preventing adolescent substance use outcomes (e.g., van der Vorst et al. 2005; Yu 2003). Paradoxically, adolescents who reported that their parents would react negatively if they used substances were less likely to be currently using alcohol or tobacco but more likely to intend to do so in the future. It is possible that some adolescents believe that as they approach young adulthood, it will be socially acceptable to drink and thus, they plan to do so in the future, despite the fact that their parents will react negatively to it. It is also possible that they see older adolescents in their lives drinking or smoking, despite their parents' beliefs, and might plan to model that same behavior. The results from this study provide evidence that, for the most part, parents can serve as a protective factor against current and future alcohol or tobacco use.

Although certain parental behaviors may protect adolescents from engaging in substance use, negative peer influence may put adolescents at risk for future use. In the current study, having peers or friends who use substances and having a greater belief that substance use is a normative activity were associated with current and future substance use. Negative peer pressure (i.e., to use substances) also was positively related to adolescents' intentions to use substances in the future. Associating with peers who use substances and being pressured to use by those peers have both been found in previous research to strongly predict adolescents' use (e.g., Barnes and Welte 1986; Kung and Farrell 2000; Simons-Morton et al. 2001). Future research should continue to consider peer influence as an important risk factor for adolescent substance use experimentation.

Taken together, these findings provide initial support for the hypothesis that cognitions about the media have an influence upon current and future adolescent substance use behaviors. Study 2 was designed to replicate and extend the findings from Study 1. Specifically, Study 2 used an additional media-related cognition found in the MIP model and two measures of critical thinking about the media as concurrent predictors of the substance use outcomes.

Study 2

Study 2 was designed to further explore the role that media-related cognitions might play in adolescents' current and future substance use. This study included all demographic, parental, peer, and media-related (MIP) influence cognitions used in Study 1 in addition to several other media-related cognitions that were adapted from Austin and colleagues (Austin and Meili 1994; Austin and Johnson 1997a, b). The primary purpose of Study 2 was similar to the main purpose of Study 1, namely to examine the extent to which media-related cognitions predict adolescent substance use and substance use cognitions above and beyond the reported influence of parents and peers.

One of the new cognitions examined in Study 2 included identification with alcohol and tobacco ads, which is considered to be a cognition that is proximally related to future substance use behaviors. Identification is explained in the MIP model as the degree to which the viewer wishes to emulate a media portrayal and is a well-documented mediator of other affective and logical cognitions that are associated with the prediction of substance use interest and behavior in children and adolescents (Austin and Meili 1994; Austin and Johnson 1997a, b; Austin et al. 1990, 2006).

Measures of two additional media-related cognitions were added to Study 2 to investigate the role that critical thinking skills regarding media messages may have in substance use behaviors. These measures included a self-report of critical thinking about media messages and a qualitatively coded measure of media deconstruction skills. Critical thinking skills are the foundational skills taught in media literacy education because of the key role they play in the interpretation of media messages. The ability to deconstruct media messages and develop counterarguments against pro-substance use messages are hypothesized to be at the heart of media literacy education used for substance abuse prevention.

Hypotheses

It was hypothesized that media-related cognitions would again explain a unique amount of variance in substance use-related outcomes over and above the variance accounted for by peer and parental variables. Specifically, it was hypothesized that perceived realism, desirability, similarity, and identification would be positively related to current and future substance use. Conversely, we expected that critical thinking about media messages and media deconstruction skills would be negatively related to current and future substance use.

Methods

Participants—Students were recruited from five middle schools in the Southeastern United States to complete a questionnaire similar to the questionnaire described in Study 1 that assessed their attitudes, behaviors, and cognitions surrounding parents, peers, media, and substance use. There were 24 classes consisting of 471 students who were recruited to participate in the study. Of the students who were recruited, 396 (84%) received parental permission to participate in the study with data collected from 6th (36.60%), 7th (19.85%), and 8th (43.56%) grade students. Participants ranged in age from 10 to 15 (M = 12.7, SD = 1.08). In addition, 43% were female, 63% were Caucasian, 8% were African-American, 6%

were Asian, 21% reported "Other", and 2% did not report their race. With respect to ethnicity, 14% reported that they were of Hispanic, Latino, or Spanish origin. Data from eight participants were not included in the analyses because they failed to complete at least 50% of the questionnaire.

Measures—Below are descriptions of the variables that were included in the study. Constructs were created by averaging respondents' scores to the relevant items. Each participant indicated their *sex* and *race* and these categorical variables were dummy-coded for use in the regression analyses.

Current Use of Alcohol and Tobacco (α = 0.85): Participants were asked the number of times that they had used either alcohol or tobacco during the last 30 days: "On how many occasions (if any) in the last 30 days have you…had an alcohol beverage to drink—more than just a few sips?", "…used a tobacco product?" One additional item asked how many times in the last 30 days the participant engaged in binge drinking: "On how many occasions (if any) in the last 30 days have you had more than 4 or 5 drinks in a row?"

Intentions to Use Alcohol and Tobacco in the Future (α = 0.89): Eight items were developed to assess adolescents' intentions to use alcohol and tobacco in the future on a four-point Likert scale ranging from 0 (*I definitely will not*) to 3 (*I definitely will*). Questions included "During the next year, do you think you will…drink beer, wine, or hard liquor (more than just a few sips)?", "…get drunk or drink a lot of alcohol at one time?", "…smoke cigarettes?", "…chew tobacco or use snuff?" Students were also asked, "Before you are 21-years-old, do you think you will…drink beer, wine, or hard liquor (more than just a few sips)?", "…get drunk or drink a lot of alcohol at one time?", and "Before you are 18-years-old, do you think you will…smoke cigarettes?", "…chew tobacco or use snuff?"

Positive Peer Pressure (α = 0.95): Two items measured how often adolescents are pressured by their friends to *not* use alcohol and tobacco. Students rated: "How often do your friends pressure you to…NOT drink alcohol?", "…NOT smoke cigarettes or other tobacco products?" The response scale ranged from 0 (*Never*) to 5 (*Always*), with higher scores indicating more pressure from peers to *not* use alcohol and tobacco.

Negative Peer Pressure (α = 0.94): Two items measured how often adolescents are pressured by their friends to use alcohol and tobacco. Students rated: "How often do your friends pressure you to…drink alcohol?", "…smoke cigarettes or use other tobacco products?" The response scale ranged from 0 (*Never*) to 5 (*Always*), with higher scores indicating more pressure from peers to use alcohol and tobacco.

Perceptions of Social Norms (α = 0.89): Media images can play a part in sustaining and creating adolescent perceptions of social norms. For example, a teen may believe that most teens drink alcohol (a social norm). They have most likely developed this perception from a variety of sources including (in part) media images, discussions with friends, and personal observation. Five items adapted from Austin and Johnson (1997a, b) measured the degree to which adolescents believed that drinking and smoking are common activities. Students rated the following statements: "Teens drink alcohol", "Friends smoke cigarettes with each other", "Parties have beer, wine, and liquor at them", "Teens smoke cigarettes", "People smoke cigarettes or use other tobacco products at parties". Response scales ranged from 0 (*Never*) to 5 (*Always*), with lower scores indicating the belief that drinking is a less common activity.

Peer Use (α = 0.87): Two questions asked how often the participant's best friend used alcohol or tobacco products during the past year. Questions included: "How often do you think your best friend…had at least one whole drink (not just a sip or a taste) of an alcoholic beverage during the past year?", and "…has smoked a cigarette or used another tobacco product during the past year?" The response scale ranged from 0 (*Never*) to 4 (*Daily*). Higher scores indicate the belief that his/her friends use alcohol or tobacco more often.

Parental Use (α = 0.59): Four questions asked how often the student's male and female parents or guardians used alcohol or tobacco products during the past year. Questions included: "How often do you think your mother or female guardian…had at least one whole drink (not just a sip or a taste) of an alcoholic beverage during the past year?", and "…has smoked a cigarette or used another tobacco product during the past year?" and were repeated for the student's father or male guardian. The response scale ranged from 0 (*Never*) to 4 (*Daily*). Higher scores indicate the belief that his/her parents use alcohol or tobacco more often.

Parental Pressure (α = 0.93): Four questions measured how much pressure adolescents felt from their parents to not use alcohol or tobacco and to stay away from peers who used alcohol and tobacco. Questions included: "Do your parents/guardians pressure you to stay away from…alcohol?", "…cigarettes or other tobacco products?", "…kids who drink alcohol?", and "…kids who smoke cigarettes or other tobacco products?" The response scale ranged from 0 (*Never*) to 5 (*Always*), with higher scores indicating more pressure from a parent to stay away from substances and substance using peers.

Parental Reaction to Potential Use (α = 0.93): Four items measured adolescents' perceptions of how happy or unhappy their parents would be if the student used alcohol or tobacco. Students responded to "How happy or unhappy would the following people be if you…drank alcohol now?", "…smoked cigarettes or used other tobacco products now?" for their mother or female guardian and their father or male guardian. The response scale ranged from 1 (*Very Happy*) to 5 (*Very Unhappy*), with higher scores indicating the belief that his/her parents would be more unhappy about his/her substance use.

Desirability of People in Alcohol and Tobacco Ads (α = 0.93): Eight items measured the degree to which adolescents found the people in alcohol and tobacco advertisements attractive. Adolescents rated the following statements separately for men and women: "Men/women in beer and cigarette ads seem…rich or wealthy", "…good-looking", "…popular", and "…happy or like they are having fun". Response scales ranged from 0 (*No, Never*) to 3 (*Yes, Always*), with higher scores indicating a greater belief that the people in alcohol and tobacco advertising are attractive.

Realism of Alcohol and Tobacco Ads (α = 0.92): Six items asked adolescents about the degree to which alcohol and tobacco ads are like real-life people and events. Students responded to how often "People in cigarette ads…do things that real smokers do", "…look like real smokers", "…act like most people act when they smoke" and to how often "People in beer ads…do things that most people do when they drink beer", "…look like real beer drinkers", "…act like most people act when they drink beer". Response scales ranged from 0 (*Never*) to 5 (*Always*). Higher scores indicate a greater belief that images in these media portrayals are realistic or typical.

Similarity to Alcohol and Tobacco Ads (α = 0.84): Eight items asked adolescents whether the people and things that appear in alcohol and tobacco ads are similar to their personal experiences. Questions included "I like the kinds of things that people in beer ads like", "I

like the kinds of things that people in tobacco ads like", "I have as much fun as people in beer ads", "I have as much fun as people in tobacco ads have", "People in beer ads are like people in my family", "People in tobacco ads on TV are like people in my family", "People I know are like the people I see in beer ads", and "People I know are like the people I see in tobacco ads". Response scales ranged from 0 (*Never*) to 5 (*Always*), with higher scores indicating a greater perception of similarity between these media portrayals and their personal experiences.

Identification with Alcohol and Tobacco Ads (α = 0.93): Six items measured the degree to which adolescents want to be like the people portrayed in alcohol and tobacco advertisements. Students rated whether "It would be fun to…do the things that people in beer ads do", "…look like the people I see in beer ads", "…be like the people in beer ads", "…do the things that people in tobacco ads do", "…look like the people I see in tobacco ads", "…be like the people in tobacco ads". Response scales ranged from 0 (*Never*) to 5 (*Always*), with lower scores indicating a lower desire to be like people portrayed in these advertisements.

Critical Thinking About Media Messages (α = 0.91): Six items measured the degree to which adolescents report that they think critically about media messages they encounter. Items included "I think about…the purpose behind a message I see on television", "…who created a message I see on TV", "…what the people who made a media message want me to believe", "…the things that advertisers do to get my attention", "…whether the things that advertisers want me to do are good for me", and "I try and think about how true or false an advertisement is". Response scales ranged from 0 (*Never*) to 5 (*Always*), with higher scores indicating that adolescents report thinking more critically about media messages.

Deconstruction Skills: To measure change in critical thinking about advertisements, participants were asked to deconstruct one alcohol and one tobacco print advertisement. Participants were asked the same three questions about each ad at each time point: "Tell me about this advertisement in the space below (the more detail the better)", "How are the advertisers trying to get someone to buy this product?", and "What type of magazine would have this advertisement in it and why?"

The resulting qualitative data were coded using five categories designed to create an aggregate score to assess adolescents' overall ability to deconstruct advertisements. The Product category was intended to capture a student's ability to recognize the product being advertised in an ad, and ranged in score from 0 to 3. The Graphic Elements category assessed a student's understanding of how advertisers use graphic elements (such as font, color, and placement of items such as warning labels) to capture attention or to make the product seem more appealing, and was scored on a scale of 0–2. The Language category evaluated a student's understanding of how slogans and advertising claims are used in advertisements, and was scored on a scale of 0–3. The Target Audience category was intended to assess a student's understanding of the term target audience and also his or her ability to recognize the target audience of a particular ad. The response scale for Target Audience also ranged from 0 to 3. Finally, the Implied Messages category was designed to assess a student's ability to recognize implied messages in ads, and the response scale ranged from 0 to 3. Together, these categories were summed to create the overall Deconstruction Skills composite variable for answers written about each advertisement. Then, scores were summed across advertisements with a total potential score ranging from 0 to 28. Twenty-one percent of the data was rated by an additional coder. The mean reliability was within acceptable limits (κ = 0.78, range = 0.64–0.86).

Procedure—A similar procedure was used to distribute and collect the consent forms as in Study 1. Those participants who had parental consent and who assented to participate were administered the paper-and-pencil questionnaires during a regular class period.

Results

Overview of the Analyses—All variables included in the analyses, except three, had less than 5% missing data. Three variables that drew from items at the end of the questionnaire had close to 9% missing data. Multiple imputation ($m = 20$) using the EM algorithm (Schafer and Graham 2002; Schafer and Olsen 1998) was utilized to handle missing data. Next, bivariate correlations were calculated between all the variables. Then, two ordered multinomial regression models were conducted. Effects for both items and subjects were included in the model and standard errors were properly adjusted for multiple observations per subject. One model included the items that made up the current substance use scale as the dependent variables and the other model included the items that made up the intentions to use substances scale as the dependent variables. In addition, both models contained all demographic and influence variables, including grade, race, sex, peer pressure (positive and negative), social norms regarding alcohol and tobacco use, peer use of substances, parental pressure not to use substances, parental reaction regarding adolescent's substance use, parental use of substances, perceived desirability of alcohol and tobacco ads, perceived realism of alcohol and tobacco ads, substance use perceived similarity to substance use media portrayals, identification with media portrayals, critical thinking about the media, and media message deconstruction skills. The intentions model also contained the measure of current substance use. After conducting the multiple regressions, the media variables also found in Study 1 (i.e., desirability, realism, similarity) were first tested together to determine whether the block predicted a unique amount of variance in the outcome variables. Then, the new media variables (i.e., identification, critical thinking, deconstruction skills) were tested together to determine whether that particular block predicted a unique amount of variance in the outcome variables over and above the first block of media variables, peer, and parental influences.

Preliminary Analyses—Descriptive statistics (e.g., mean, standard deviations) were examined for each construct (see Table 1). A bivariate correlation was calculated for the two outcome variables, current alcohol or tobacco use and intentions to use alcohol or tobacco (see Table 4). It revealed a significant positive association between the two outcome variables such that the more that adolescents have used alcohol or tobacco in the past 30 days, the more they intend to use substances in the future ($r = 0.47$, $p < 0.0001$). In addition, interscale correlations were calculated among the influence variables. The correlations ranged from a low of 0 (social norms and peer pressure not to use; perceived realism and perceived similarity) to a high of 0.60 (intentions to use and peer use). The average interscale correlation between pairs of influence variables was 0.15. This suggests that the influence variables were sufficiently distinct to be examined as individual predictors of substance use outcomes.

Main Outcome Findings: Current Substance Use—These analyses revealed that the inclusion of all the variables in the model accounted for a significant amount of the variance in adolescents' use of alcohol or tobacco in the past 30 days, $F(16, 145592) = 6.82$, $p < 0.0001$ (see Table 3). Specifically, factors that were related to higher levels of alcohol or tobacco use were greater beliefs that alcohol or tobacco use is a normative activity, having peers who have used substances in the past, and increased identification with substance use media portrayals. The media variables were tested together in two blocks. The first block included the media variables used in the Study 1 analyses. These influence variables (i.e., desirability, realism, and similarity) were not found to predict a significant amount of

variance in adolescents' substance use over and above the demographic, peer, and parental variables, $F(3, 24908) = 0.85$, p = ns. The second block included the newly added media variables. These influence variables (i.e., identification, critical thinking, and deconstruction skills) were found to predict a significant amount of variance in adolescents' substance use over and above the demographic, peer, parental, and original media variables, $F(3, 6490) = 2.96$, $p < 0.05$.

Main Outcome Findings: Intentions to Use Substances—These analyses revealed that the inclusion of all the variables in the model accounted for a significant amount of variance in adolescents' intentions to use substances, $F(17, 39213) = 33.83$, $p < 0.0001$ (see Table 3). Specifically, factors that were related to higher levels of intentions to use alcohol and tobacco in the future were higher grade level, being Caucasian, alcohol or tobacco use in the past 30 days, peer pressure to use substances, greater beliefs that alcohol or tobacco use is a normative activity, having peers who have used substances in the past, and increased similarity to and identification with substance use media portrayals. Parental pressure not to use substances, adolescents' perceptions of a negative parental reaction to their substance use, self-reported critical thinking skills, and qualitatively assessed deconstruction skills predicted lower levels of intentions to use alcohol and tobacco in the future. The media variables were tested together in two blocks. The first block included the media variables used in the Study 1 analyses. These influence variables (i.e., desirability, realism, and similarity) were found to predict a significant amount of variance adolescents' substance use over and above the demographic, peer, and parental variables, $F(3, 4855) = 4.21$, $p < 0.01$. The second block included the Study 2 media variables. These influence variables (i.e., identification, critical thinking, and deconstruction skills) were found to predict a significant amount of variance in adolescents' substance use over and above the demographic, peer, parental, and original media variables, $F(3, 1239) = 22.63$, $p < 0.0001$.

Preliminary Discussion—This study added to the findings reported in Study 1 in two ways. First, the analyses revealed the utility of a number of media-related constructs for predicting adolescent substance use outcomes. After controlling for the media variables also found in Study 1 and all other variables in the model, analyses of the second block of variables found that together they predicted a unique amount of variance. This indicates that the second set of media variables (i.e., identification, critical thinking, and deconstruction skills) contributes something different in the prediction of adolescent substance use outcomes, even in the presence of other significant media predictors.

As described before, identification is the degree to which the viewer wishes to emulate a media portrayal and has been shown to mediate the influences of similarity, realism, and desirability on intentions to use substances (Austin and Johnson 1997a, b, 2006). As previously tested by Austin and colleagues (Austin and Johnson 1997b; Austin and Meili 1994), identification emerged as the most proximal factor that may drive the influence of media on decisions to drink alcohol and use tobacco products now and in the future. Results from these analyses further support that conclusion.

Intentions to use substances were predicted by adolescents' self-reports of how often they think critically about advertisements and a qualitative measure of how skilled they are in media deconstruction as scored by trained coders. In the context of the MIP model, individuals who possess effective logical processing skills are less likely to be affected by strong emotional appeals found in advertising. For instance, an adolescent who deconstructs an alcohol advertisement might find the models to be attractive and popular, but after realizing the implausibility of the message, he or she is more likely to attribute more negative consequences to drinking alcohol. Consideration of the negative consequences

stemming from using substances may influence adolescents' cognitions regarding the use of substances in the future.

Second, parents and peers were also found to have an influence on adolescents' substance use outcomes as was found in Study 1. Specifically, parental pressure to abstain from alcohol or tobacco use was associated with a decreased likelihood of future use. Further, adolescents who believed that their parents would react negatively to their substance use reported less intention to use substances in the future. In contrast, peer influence may encourage rather than prevent adolescents from engaging in future substance use. As found in Study 1, having peers who use substances and having a greater belief that substance use is a normative activity were associated with increased rates of current and future substance use. Negative peer pressure (i.e., to use substances) also was positively related to adolescents' intentions to use substances in the future. The findings across both studies highlight the importance of examining both parents and peers as risk and protective factors with respect to adolescent substance use.

Overall, the findings from Study 2 reveal that media and, consequently, media-related cognitions, have a unique influence on adolescents' intent to use substances above and beyond the influence one's own current use of substances as well as the influence of parents and peers. In addition, media and, consequently, media-related cognitions, have a unique influence on adolescents' current substance use above and beyond the influence of parents and peers. Specifically, identification with media messages is a key risk factor for adolescent substance use both now and in the future, while critical thinking about media messages may act as a protective factor against future substance use.

General Discussion

The major contribution of this article is that the examination of exosystem variables added to the prediction of adolescent outcomes controlling for exposure to microsystem variables. Specifically, cognitions about media messages were examined as examples of exosystem variables and were found to uniquely influence adolescents' current substance use and cognitions about substance use even after the analyses controlled for the important microsystem influences of parents and peers. Notably, the two studies described in this article were the first to examine the simultaneous influence of peers, parents, and media on adolescents' substance use behaviors and cognitions A strength of this work is that the analyses used significantly different samples but resulted in somewhat similar overall findings about the roles of parents, peers, and the media in predicting adolescent substance use outcomes. Specifically, this work reveals that media-related cognitions should be further investigated because of the unique contribution that they have been shown to have for important health outcomes above and beyond other well-known influences.

Media as sources of information for adolescents is becoming more widely studied. For example, one such study revealed that adolescents nominated media as sources used to access sexual information more often than doctors and close to as often as mothers (e.g., friends (74.9%), teachers (62.2%), mother (60.9%), and media (57%), doctors (41.5%), Bleakley et al. 2009). In fact, media have been likened to “sexual super peers” for early maturing girls, providing sexual norms and instruction especially if insufficient guidance is found from parents, teachers, and non-pubertal peers (Brown et al. 2005). Within a substance abuse prevention context, the mechanisms by which peers influence experimentation with substances include providing a model of drug use; positively influencing norms, attitudes and values related to drug use; and enabling or aiding opportunities for drug use (Bauman and Ennett 1996). One could make a similar argument

for the mechanisms through which media facilitate adolescent substance use, likening media to “substance use super peers”.

Media messages surrounding alcohol, tobacco, and other drugs often model the use of substances by presenting it in an exciting, glamorous, consequence-free way. Substance use is portrayed as the norm and using substances is seen as a way to fit in, have fun, or relieve stress. Further, the storylines and messages that are conveyed about substance use in the media often conflict with messages that adolescents receive from parents and teachers about the risky and negative health effects of substance use. Because entire youth cohorts are simultaneously exposed to these positive messages regarding substance use, youth culture is being shaped and directed in ways that may be deleterious to their health and well-being. This idea raises a significant question about the relative influence that the media have on adolescents in the context of other important and persuasive interpersonal influences. In fact, the present findings concur, replicate and extend findings suggesting that not only are media influences not inconsequential, but remain important within a broader developmental context.

These current studies support the application of the MIP model for examining media cognitions in relation to a particular decision relevant to adolescents' lives, namely, the decision to use alcohol or tobacco products. The model was fruitful for identifying key cognitions for examination and the findings replicated previous studies conducted by Austin and colleagues (Austin et al. 2006; Austin and Johnson 1997a, b) that suggested that identification with alcohol and tobacco media messages is one of the most proximal cognitions to the decision to use. Austin suggests that these media-related cognitions are attitudinal and can not be directly manipulated; however, she suggested that identification with media messages may be influenced by an increase in critical thinking skills that target both the logical and emotional components as described in the decision-making process (Austin and Johnson 1997a).

One approach to substance abuse prevention is to use media literacy education, which provides training in the deliberate and thoughtful processing of media messages. This kind of critical thinking allows for the anti-substance use messages to be generated by the adolescent in response to the perceived manipulative influence of media messages. Some adolescents are defiant in the presence of authority and this elicited psychological reactance has been related to substance use behaviors (Miller et al. 2006; Allen et al. 1994). Therefore, authority-led or drug education substance abuse prevention programs may not be particularly effective for preventing substance use (e.g., evaluations of D.A.R.E., Lynam et al. 1999; Ennett et al. 1994), especially for youth high in reactance. Media literacy education conducted impartially can sidestep this bias and still provide a strong prevention message. Providing children with skills to make informed decisions for themselves should empower them and provide a means to avoid a reactant response.

Two recently completed randomized controlled trials provide supportive evidence that media literacy education for elementary (i.e., *Media Detective*: Kupersmidt et al. 2007) and middle school students (i.e., *Media Ready*: Barrett et al. 2008) can be a successful prevention approach. Students participating in these programs showed increases in critical thinking skills about media messages and reductions in intent to use tobacco products as well as reductions in boys' interest in alcohol-branded merchandise and intent to use alcohol. Promising results from the aforementioned as well as other evaluations (e.g., DeBenedittis et al. 2000; Austin and Johnson 1997b) suggest the need for early and sustained media literacy education.

There are three limitations identified in the research design used for these studies. First, utilizing a cross-sectional design limits our ability to infer causal relationships among the variables. Although the analyses suggested a concurrent influence of parent, peer, and media-related cognitions on substance use-related cognitions, the direction of effect cannot be determined without using an experimental or longitudinal design. This suggests an important direction for future research. Nonetheless, a plethora of studies using a wide range of methodologies have concluded that exposure to aggressive media messages are associated with increases in aggressive behavior (Anderson and Bushman 2002; Slater et al. 2003; Huesmann and Taylor 2006; Huesmann et al. 2003). Thus, one might expect to observe similar influence processes with respect to the relationships between media-related cognitions and substance use. Second, these two studies relied only on data gathered from adolescents' self-reports, and single-reporter data tend to overestimate associations between constructs. However, adolescent reports of other similar constructs, like parenting behaviors and attitudes, have been found to be valid and stable over time (Metzler et al. 1998). Future studies might explore data on parental and peer behavior that is gathered from multiple informants, including parents and peers. Third, participating schools in the studies constituted a convenience sample and were not randomly sampled; therefore, it cannot be assumed that these particular students are representative of all U.S. students. This presents a limitation to external validity, and caution should be made in generalizing the results obtained in these analyses to the greater population.

In conclusion, this article adds to the growing literature on the importance of considering adolescent cognitions about substance use in developmental and prevention research. Both studies illustrate that media messages play a role in predicting adolescents' current alcohol or tobacco use and intentions to use alcohol or tobacco products in the future. The findings also suggest that multiple factors influence decision-making and that developmental processes need to be empirically examined using a broad contextual lens in order to more effectively understand and prevent adolescent risky health behaviors.

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References

Allen DN, Sprenkel DG, Vitale PA. Reactance theory and alcohol consumption laws: Further confirmation among collegiate alcohol consumers. Journal of Studies on Alcohol. 1994; 55:34–40. [PubMed: 8189723]

Anderson CA, Bushman BJ. The effects of media violence on society. Science. 2002; 295:2377–2379. [PubMed: 11923513]

Atkin CK, Neuendorf K, McDermott S. The role of alcohol advertising in excessive and hazardous drinking. Journal of Drug Education. 1983; 13(4):313–324.

Atkin C, Hocking J, Block M. Teenage drinking: Does advertising make a difference? Journal of Communication. 1984; 34(2):157–167.

Austin EW, Johnson KK. Effects of general and alcohol-specific media literacy training on children's decision making about alcohol. Journal of Health Communication. 1997a; 2(1):17–42. [PubMed: 10977232]

Austin EW, Johnson KK. Immediate and delayed effects of media literacy training on third grader's decision making for alcohol. Health Communication. 1997b; 9(4):323–349.

Austin EW, Meili HK. Effects of interpretations of televised alcohol portrayals on children's alcohol beliefs. *Journal of Broadcasting* & *Electronic Media*. 1994; 38(4):417–435.

Austin EW, Roberts DF, Nass CI. Influences of family communication on children's television-interpretation processes. Communication Research. 1990; 17(4):545–564.

Austin EW, Chen MJ, Grube JW. How does alcohol advertising influence underage drinking? The role of desirability, identification and skepticism. Journal of Adolescent Health. 2006; 38(4):376. [PubMed: 16549298]

Bandura, A. Social foundations of thought and action: A social cognitive theory. Prentice-Hall; Englewood Cliffs, NJ: 1986.

Barnes GM, Farrell MP. Parental support and control as predictors of adolescent drinking, delinquency, and related problem behaviors. Journal of Marriage and the Family. 1992; 54(4): 763–776.

Barnes GM, Welte JW. Patterns and predictors of alcohol use among 7–12th grade students in New York State. Journal of Studies on Alcohol. 1986; 47:53–62. [PubMed: 3485740]

Barrett, TM.; Kupersmidt, JB.; Benson, JW.; Elmore, KC. Exploration of mediators and moderators of a media literacy, substance abuse prevention program for middle school students. Poster presented at the society for research on adolescence conference; Chicago, IL. 2008.

Bauman K, Ennett S. On the importance of peer influence for adolescent drug use: Commonly neglected considerations. Addiction. 1996; 91:184–196.

Bleakley A, Hennessy M, Fishbein M, Jordan A. How sources of sexual information relate to adolescents' beliefs about sex. American Journal of Health Behavior. 2009; 33(1):37–48. [PubMed: 18844519]

Bronfenbrenner U. Contexts of child rearing: Problems and prospects. American Psychologist. 1979; 34(10):844.

Brown SA, Creamer VA, Stetson BA. Adolescent alcohol expectancies in relation to personal and parental drinking patterns. Journal of Abnormal Psychology. 1987; 96(2):117–121. [PubMed: 3584659]

Brown SA, Tapert SF, Granholm E, Delis DC. Neurocognitive functioning of adolescents: Effects of protracted alcohol use. Alcoholism, Clinical and Experimental Research. 2000; 24:164–171.

Brown JD, Halpern CT, L'Engle KL. Mass media as a sexual super peer for early maturing girls. Journal of Adolescent Health. 2005; 36:420–427. [PubMed: 15837346]

Center for Tobacco Free Kids. KBD 2000 survey. 2000. Retrieved on Jul 26, 2004 from http://www.kickbuttsday.org/survey

Christenson, PG.; Henriksen, L.; Roberts, DF. Substance use in popular prime-time television. Office of National Drug Control Policy, Mediascope. 2000. Retrieved on Jul 26, 2004 from http://www.mediacampaign.org/newsroom/press00/exec_summary.html

Cohen DA, Richardson J. Parenting behaviors and the onset of smoking and alcohol use: A longitudinal study. Pediatrics. 1994; 94(3):368–375. [PubMed: 8065865]

Cooper ML, Orcutt HK. Drinking and sexual experience on first dates among adolescents. Journal of Abnormal Psychology. 1997; 106(2):191. [PubMed: 9131839]

D'Amico EJ, Edelen MO, Miles NV, Morral AR. The longitudinal association between substance use and delinquency among high-risk youth. Drug and Alcohol Dependence. 2008; 93:85–92. [PubMed: 17977669]

Dalton MA, Sargent JD, Beach ML, Titus-Ernstoff L, Gibson JJ, Ahrens MB, et al. Effect of viewing smoking in movies on adolescent smoking initiation: A cohort study. The Lancet. 2003; 362:281–285.

DeBenedittis, P.; Loughery, M.; McCannon, B.; Goldborough, S. Alcohol prevention children love to learn. Presented to the alcohol policy XII conference, alcohol & crime, research for practice and prevention; Washington, DC. 2000.

Distefan J, Pierce J, Gilpin E. Do favorite movie stars influence adolescent smoking initiation? American Journal of Public Health. 2004; 94(7):1239–1244. [PubMed: 15226149]

Ellickson PL, Collins RL, Hambarsoomians K, McCaffrey DF. Does alcohol advertising promote adolescent drinking? Results from a longitudinal assessment. Addiction. 2005; 100(2):235–246. [PubMed: 15679753]

Ennett ST, Tobler NS, Ringwalt CL, Flewelling RL. How effective is drug abuse resistance education? A meta-analysis of Project DARE outcome evaluations. American Journal of Public Health. 1994; 84(9):1394–1401. [PubMed: 8092361]

Gentile, DA.; Walsh, DA.; Bloomgren, BW., Jr.; Atti, JA.; Norman, JA. Frogs sell beer: The effects of beer advertisements on adolescent drinking knowledge, attitudes, and behavior. Paper presented at the biennial conference of the society for research in child development; Minneapolis, MN. 2001.

Gidwani PP, Sobol A, DeJong W, Perrin JM, Gortmaker SL. Television viewing and initiation of smoking among youth. Pediatrics. 2002; 110(3):505–508. [PubMed: 12205251]

Harakeh Z, Scholte RHJ, Vermulst AA, de Vries H, Engels RCME. Parental factors and adolescents' smoking behavior: An extension of the theory of planned behavior. Preventive Medicine. 2004; 39(5):951–961. [PubMed: 15475029]

Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. Psychological Bulletin. 1992; 112(1):64–105. [PubMed: 1529040]

Hoffman BR, Sussman S, Unger JB, Valente TW. Peer influences on adolescent cigarette smoking: A theoretical review of the literature. Substance Use and Misuse. 2006; 41:103–155. [PubMed: 16393739]

Hops H, Duncan TE, Duncan SC. Parent substance use as a predictor of adolescent use: A six-year lagged analysis. Annals of Behavioral Medicine. 1996; 18(3):157–164.

Huesmann LR, Taylor LD. The role of media violence in violent behavior. Annual Review of Public Health. 2006; 27:393.

Huesmann LR, Moise-Titus J, Podolski C, Eron LD. Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977–1992. Developmental Psychology. 2003; 39:201–221. [PubMed: 12661882]

Huizinga, D.; Loeber, R.; Thornberry, TP. Recent findings from the program of research on the causes and correlates of delinquency. Office of Juvenile Justice and Delinquency Prevention; Washington, DC: 1995.

Jacobsen LK, Picciotto MR, Heath CJ, Frost SJ, Tsou KA, Dwan RA, et al. Prenatal and adolescent exposure to tobacco smoke modulates development of white matter microstructure. The Journal of Neuroscience. 2007; 27:13491–13498. [PubMed: 18057207]

Jacobus J, Bava S, Cohen-Zion M, Mahmood O, Tapert SF. Functional consequences of marijuana use in adolescents. Pharmacology, Biochemistry and Behavior. 2009; 92:559–565.

Johnson PB, Johnson HL. Reaffirming the power of parental influence on adolescent smoking and drinking decisions. *Adolescent* & *Family Health*. 2001; 2(1):37–43.

Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the future national results on adolescent drug use: Overview of key findings, 2007. National Institute on Drug Abuse; Bethesda, MD: 2008. NIH publication no. 08-6518

Kodl MM, Mermelstein R. Beyond modeling: Parenting practices, parental smoking history, and adolescent cigarette smoking. Addictive Behaviors. 2004; 29(1):17–32. [PubMed: 14667418]

Kung EM, Farrell AD. The role of parents and peers in early adolescent substance use: An examination of mediating and moderating effects. Journal of Child and Family Studies. 2000; 9(4): 509.

Kupersmidt, JB.; Barrett, TM.; Elmore, K. Preliminary findings from the evaluation of the elementary media literacy, *substance abuse prevention project*. Paper presented at the first meeting of the alliance for a media literate America; St. Louis, Missouri. 2007.

Lynam DR, Milich R, Zimmerman R, Novak SP, Logan TK, Martin C, et al. Project DARE: No effects at 10-year follow-up. Journal of Clinical and Consulting Psychology. 1999; 67(4):590–593.

Metzler CW, Biglan A, Ary DV, Li F. The stability and validity of early adolescents' reports of parenting constructs. Journal of Family Psychology. 1998; 12(4):600.

Miller CH, Burgoon M, Grandpre J, Alvaro E. Identifying principal risk factors for the initiation of adolescent smoking behaviors: The significance of psychological reactance. Health Communication. 2006; 19:241–252. [PubMed: 16719727]

National Highway Traffic Safety Administration (NHTSA). Dept. of Transportation (US). Traffic safety facts 2005: young drivers. Washington (DC): 2006. Available from: URL: http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2005/YoungDriversTSF05.pdf

Oetting ER, Beauvais F. Peer cluster theory: Drugs and the adolescent. *Journal of Counseling* & *Development*. 1986; 65(1):17.

Primack BA, Dalton MA, Carroll MV, Agarwal AA, Fine MJ. Content analysis of tobacco, alcohol, and other drugs in popular music. *Archives of Pediatric* & *Adolescent Medicine*. 2008; 162(2): 169–175.

Rideout, V.; Roberts, DF.; Foehr, UG. *Generation M: Media in the lives of 8 – 18 year-olds*. The Henry J. Kaiser Family Foundation; Menlo Park, CA: 2005.

Robinson, T.; Chen, H.; Killen, J. Television and music video exposure and risk of adolescent alcohol use. 1998. http://www.pediactrics.org/cgi/content/full/102/5/e54

Sargent JD, Wills TA, Stoolmiller M, Gibson J, Gibbons FX. Alcohol use in motion pictures and its relation with early-onset teen drinking. Journal of Studies on Alcohol. 2006; 67:54–65. [PubMed: 16536129]

Schafer JL, Graham JW. Missing data: Our view of the state of the art. Psychological Methods. 2002; 7(2):147. [PubMed: 12090408]

Schafer JL, Olsen MK. Multiple imputation for multivariate missing-data problems: A data analyst's perspective. Multivariate Behavioral Research. 1998; 33(4):545.

Simons-Morton BG, Haynie DL. Psychosocial predictors of increased smoking stage among sixth graders. American Journal of Health Behaviors. 2003; 27(6):592–602.

Simons-Morton B, Haynie DL, Crump AD, Eitel P, Saylor KE. Peer and parent influences on smoking and drinking among early adolescents. *Health Education & Behavior*. 2001; 28(1):95. [PubMed: 11213145]

Slater MD, Henry KL, Swaim RC, Anderson LL. Violent media content and aggressiveness in adolescents: A downward spiral model. Communication Research. 2003; 30:713–736.

Steinberg L, Fletcher A, Darling N. Parental monitoring and peer influences on adolescent substance use. Pediatrics. 1994; 93:1–5. [PubMed: 8265301]

Strasburger VC, Donnerstein E. Children, adolescents, and the media: Issues and solutions. Pediatrics. 1999; 103(1):129–139. [PubMed: 9917450]

van der Vorst H, Engels RCME, Meeus W, Dekovic M, Van Leeuwe J. The role of alcohol-specific socialization in adolescents' drinking behaviour. Addiction. 2005; 100(10):1464. [PubMed: 16185208]

Webb JA, Baer PE, Getz JG, McKelvey RS. Do fifth graders' attitudes and intentions toward alcohol use predict seventh-grade use? *Journal of the American Academy of Child & Adolescent Psychiatry*. 1996; 35(12):1611. [PubMed: 8973067]

Yu J. The association between parental alcohol-related behaviours and children's drinking. Drug and Alcohol Dependence. 2003; 69:253–262. [PubMed: 12633911]

Table 1

Mean scores and standard deviations for outcome, demographic, peer influence, parental influence, and media influence variables for Study 1 (N = 351) and Study 2 (N = 378)

Variable	Study 1		Study 2	
	M	SD	*M*	SD
Outcomes				
Current use	0.45	1.96	0.19	1.22
Intentions to use	0.46[a]	0.57	0.32[c]	0.49
Peer influence				
Peer pressure (positive)	1.01[b]	0.79	2.57[e]	1.84
Peer pressure (negative)	0.30[b]	0.56	0.78[e]	1.35
Social norms	1.50[c]	0.78	2.66[e]	1.07
Peer use	0.46[a]	0.83	0.23[a]	0.68
Parental influence				
Parental pressure	1.54[b]	0.60	3.63[e]	1.39
Parental reaction	4.44[f]	0.82	3.54[f]	0.87
Parental use	1.04[a]	0.92	1.12[a]	0.92
Media influence				
Desirability	1.53[c]	0.89	3.18[e]	1.39
Realism	1.43[c]	0.84	1.97[e]	1.26
Similarity	0.37[c]	0.60	1.01[e]	0.89
Identification	-	-	0.77[e]	1.03
Critical thinking	-	-	2.42[e]	1.38
Deconstruction skills	-	-	9.11[g]	3.27

[a] Range = 0–4

[b] Range = 1–3

[c] Range = 0–3

[d] Range = 1–4

[e] Range = 0–5

[f] Range = 1–5

[g] Range = 0–28

Table 2

Correlation matrix for Study 1

Variables	Substance use		Peer influence				Parental influence			Media influence		
	1	2	3	4	5	6	7	8	9	10	11	12
1. Current use	1.00	0.34***	−0.02	0.09***	0.19***	0.40***	−0.18***	−0.21***	0.03*	−0.02	0.16***	0.22***
2. Intentions to use		1.00	−0.12***	0.25***	0.17***	0.33***	−0.23***	−0.16***	0.12***	0.18***	0.08***	0.36***
3. Positive peer pressure			1.00	0.01	−0.04**	−0.18***	0.42***	0.10***	−0.09***	0.03**	0.10***	−0.01
4. Negative peer pressure				1.00	0.27***	0.28***	0.00	−0.12***	0.12***	0.14***	0.18***	0.26***
5. Social norms					1.00	0.28***	−0.05***	−0.24***	0.10***	0.16***	0.39***	0.19***
6. Peer use						1.00	−0.20***	−0.19***	0.27***	0.07***	0.19***	0.23***
7. Parental pressure							1.00	0.23***	−0.18***	0.05***	0.05***	−0.12***
8. Parental reaction								1.00	−0.21***	0.06***	−0.13***	−0.27***
9. Parental use									1.00	0.08***	0.00	0.02*
10. Desirability										1.00	0.23***	0.01
11. Realism											1.00	0.20***
12. Similarity												1.00

N = 351

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$

Table 3

Demographics, peer influences, parental influences, and media influences predicting for adolescents' current and future substance use for Study 1 ($N = 351$) and Study 2 ($N = 378$)

Variable	Study 1				Study 2			
	Current use		Intentions to use		Current use		Intentions to use	
	b	SE	*b*	SE	*b*	SE	*b*	SE
Demographics								
Grade	−0.05	0.17	0.18*	0.08	0.08	0.24	0.49***	0.07
Race[a]	0.53*	0.27	0.83***	0.06	−0.31	0.40	0.31**	0.12
Sex[b]	0.77**	0.26	−0.36**	0.12	0.44	0.43	0.10	0.12
Current use	-	-	0.15***	0.03	-	-	0.31***	0.05
Peer influence								
Peer pressure (positive)	−0.11	0.16	−0.11	0.08	−0.04	0.14	0.01	0.04
Peer pressure (negative)	0.10	0.20	0.36**	0.10	−0.11	0.15	0.11**	0.04
Social norms	0.37*	0.17	0.20*	0.08	0.59**	0.21	0.19**	0.06
Peer use	0.89***	0.11	0.21*	0.08	1.06***	0.19	0.59***	0.08
Parental influence								
Parental pressure	−0.74***	0.18	−0.54***	0.10	0.03	0.18	−0.17**	0.05
Parental reaction	−0.16*	0.13	0.15*	0.03	−0.33	0.19	−0.26**	0.07
Parental use	−0.06	0.13	0.09	0.07	−0.05	0.21	−0.01	0.07
Media influence								
Desirability	−0.14	0.14	0.26***	0.07	0.17	0.19	−0.04	0.05
Realism	0.16	0.15	0.02	0.08	0.20	0.18	0.02	0.05
Similarity	0.54**	0.17	0.62***	0.10	0.18	0.24	0.26**	0.08
Identification	-	-	-	-	0.41*	0.21	0.51***	0.07
Critical thinking	-	-	-	-	0.26	0.15	−0.17**	0.05
Deconstruction skills	-	-	-	-	0.07	0.06	−0.04*	0.02

[a]Reference group is caucasian

[b]Reference group is male

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$

Table 4

Correlation matrix for Study 2

Variables	Substance use		Peer influence				Parental influence			Media influence					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Current use	1.00	0.47***	−0.01	0.06***	0.17***	0.38***	−0.05***	−0.13***	0.19***	0.04**	0.08***	0.20***	0.22***	0.05***	−0.03*
2. Intentions to use		1.00	−0.14***	0.16***	0.24***	0.60***	−0.28***	−0.27***	0.24***	0.10***	0.03	0.36***	0.47***	−0.12***	−0.08***
3. Positive peer pressure			1.00	0.20***	0.00	−0.13***	0.54***	−0.05***	−0.14***	−0.06***	0.10***	−0.11***	−0.19***	0.25***	0.06***
4. Negative peer pressure				1.00	0.18***	0.17***	0.12***	−0.19***	−0.09***	−0.02	0.10***	0.10***	0.05***	0.06***	−0.12***
5. Social norms					1.00	0.21***	0.09***	−0.14***	0.08***	0.05***	0.23***	0.14***	0.17***	0.05***	−0.15***
6. Peer use						1.00	−0.23***	−0.30***	0.33***	0.01	0.08***	0.25***	0.31***	−0.13***	−0.11***
7. Parental pressure							1.00	0.05***	−0.23***	−0.11***	0.12***	−0.24***	−0.29***	0.19***	−0.03*
8. Parental reaction								1.00	−0.14***	0.03*	−0.08***	−0.09***	−0.11***	0.04**	0.22***
9. Parental use									1.00	0.05***	−0.01	0.17***	0.23***	−0.05***	0.06***
10. Desirability										1.00	−0.20***	0.28***	0.38***	0.13***	0.26***
11. Realism											1.00	0.00	−0.13***	0.02	−0.19***
12. Similarity												1.00	0.55***	0.04*	0.07***
13. Identification													1.00	−0.01	0.11***
14. Critical thinking														1.00	0.09
15. Deconstruction skills															1.00

N = 378

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$