

Investigation of mechanisms linking media exposure to smoking in high school students

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Abstract

Background. Media exposure has been found to impact adolescent smoking, although the mechanisms of this relationship have not been thoroughly investigated. Drive for thinness and tobacco advertising receptivity, both shown to be associated with smoking, are two potential mediators.

Methods. 967 twelfth grade students completed a self-report survey as part of a longitudinal study of biobehavioral predictors of smoking. Exposure to magazines and television, drive for thinness, tobacco advertisement receptivity, and twelfth grade smoking level were the primary variables of interest. Effects of gender, race, BMI, smoking exposure, and perceived physical appearance were controlled for in the model.

Results. Exposure to fashion, entertainment, and gossip magazines had indirect effects on smoking via drive for thinness and tobacco advertisement receptivity. There was a direct effect of health, fitness, and sports magazine reading on smoking. Television watching had no significant effects on smoking.

Conclusions. Adolescents who read fashion, entertainment, and gossip magazines may be more likely to smoke, in part, because of a higher drive for thinness and greater receptivity to cigarette advertisements. Conversely, adolescents reading Health and Fitness magazines may be less likely to smoke. Drive for thinness and tobacco advertising receptivity are thus potential targets for adolescent smoking intervention.

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Introduction

Adolescent smoking is a significant public health problem with many psychosocial correlates [1,2]. A less studied but potentially important question may be how mass media exposure affects adolescent smoking. Research has shown that television viewing is associated with smoking initiation in adolescents [3]. Promotional advertising, an important aspect of mass media exposure, has been shown to have direct effects on adolescent smoking progression [4–7]. In fact, one third of all experimentation with cigarettes during a three year prospective cohort study was deemed causally related to tobacco advertising [6]. Cigarette brands smoked by adolescents have been found to be advertised

more in youth-oriented magazines, suggesting that youth are exposed to such ads [8,9]. Tobacco advertisements appear to convey an attractive, hip lifestyle that young people find desirable [10].

The perception that smoking reduces body weight is another important variable encouraging smoking among adolescents, particularly young women [11,12]. One study found that elevated drive for thinness scores in girls age 11–12 years predicted daily smoking 7 years later [13]. Focus groups of high school students reveal the belief that smoking will prevent weight gain and even cause weight loss [10]. In fact, a recent prospective study found that girls who value thinness strongly were nearly five times more likely to become established smokers 4 years later [14]. Another study found that body dissatisfaction and eating pathology in adolescent girls increased the risk four-fold for regular smoking [15]. Dieting is also associated with smoking. Trying to lose weight, constant thoughts about

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weight, and having more than three eating disorder symptoms were each shown to double the risk for smoking initiation after 1 year [16]. It also appears that the more one diets, the greater one's future risk of smoking; up to four times greater as found in a large prospective survey of middle school students [17]. Preoccupation with weight and achieving thinness are thus important variables in adolescent smoking.

A large body of experimental, cross-sectional, and prospective research suggests that exposure to magazine images depicting thin bodies increases drive for thinness and body dissatisfaction, especially in young women [11,18–24]. There are some data suggesting similar effects in boys and young men [22,25]. However, to date, the associations between mass media, tobacco advertising receptivity, the desire to be thin, and smoking have been investigated in just one cross-sectional study [12]. This survey of female undergraduates found that smoking was associated with the belief that smoking controls weight, with low levels of skepticism about tobacco ads, and with greater exposure to fashion and entertainment magazines (reading three to four magazines per month). Thus, drive for thinness and tobacco ad receptivity, both shown to be associated with smoking, may explain why media exposure is related to adolescent smoking.

We hypothesized that the relationship between media exposure (exposure to magazines and television) and smoking would be indirect, through the effects of drive for thinness and receptivity to tobacco advertising. More specifically, a sequential relationship was proposed such that reading magazines and watching television would increase the likelihood of receptivity to tobacco advertisements and drive for thinness, which would in turn increase the likelihood of smoking. This hypothesis is consistent with Collins and colleagues' three-step framework for defining mediation [26]. First, the probability of an individual undergoing the sequence of independent variable to mediator, and then from mediator to outcome variable, is greater for individuals with higher levels of the independent variable. Second, having a higher level of the independent variable increases the likelihood of the mediator. Third, for every level of the independent variable, the mediator increases the likelihood of the dependent variable [26]. The independent variable in the present study was media exposure, the mediator variables were drive for thinness and tobacco advertising receptivity, and the outcome variable was current smoking. We also hypothesized that the effects of media exposure on drive for thinness, tobacco advertisement receptivity, and their subsequent effects on smoking would be observed for fashion and entertainment magazines, but not for fitness or sports magazines. Research has not consistently found a relationship between reading fitness and sports magazines or watching sports television and drive for thinness [22,27]. In addition, tobacco advertisements do not appear (or appear infrequently) in fitness and sports magazines.

Finally, we expected the indirect effects of media exposure on smoking through drive for thinness would be more pronounced for females than males.

Methods

Participants

This cross-sectional study included 967 twelfth grade students participating in a study of the biobehavioral predictors of adolescent smoking. The participants were taken from a cohort that initially contained 1136 students. Details of the formation of this cohort are described elsewhere [28]. One thousand and two participants had complete data on twelfth grade smoking practices. Differences among the 134 participants with missing data on twelfth grade smoking practices are discussed below. This cross-sectional study includes results from the 967 twelfth grade participants with data available for all variables in the model. We used data from the twelfth grade, as this is the only year for which data on drive for thinness and media exposure were collected.

Participants were enrolled in five public high schools in northern Virginia. The cohort was identified from class rosters in the 9th grade and followed until the end of the twelfth grade. Students were not enrolled if they required special classroom placement (i.e. severe learning disability and/or English as a second language). Consent was obtained from parents at the study's inception, as was student assent. There was a small but significant difference between those parents who provided consent and those parents who did not. The likelihood of parental consent was greater for Caucasian parents with more than a high school education than for those with a high school education or less (89% versus 76%) [28]. Approval of the study protocol was obtained from the university institutional review board.

Survey administration procedures

Data were collected on-site, in compulsory classes, through a self-administered paper survey. Research team members explained the survey and provided clarification while stressing the importance of honesty and confidentiality. Surveys took approximately 20 min to complete. Each survey was labeled with an identification number to maintain participant confidentiality. Make-up sessions were held for students absent during the initial survey administration. Participants received \$5 video gift certificates in appreciation for completing the survey.

Primary variables of interest were exposure to magazines and television, drive for thinness, tobacco advertising receptivity, twelfth grade smoking level, exposure to family and peer smoking, perceived physical appearance, body mass index, gender, and race. The data presented in the

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