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Does Technology Use Moderate the Relationship Between Parental Alcoholism and Adolescent Alcohol and Cigarette Use?

Christine McCauley Ohannessian, Ph.D.^a

University of Delaware

Abstract

The primary goals of this study were to examine the associations between technology use and alcohol and cigarette use during adolescence and to explore whether technology use moderates the relationship between parental alcoholism and substance use (alcohol and cigarette use). The sample included 328 14–16 year-old adolescent boys and girls. The adolescents completed a battery of self-report questionnaires which included measures that assessed their substance use, their use of technology, and their parents' alcohol use (including alcoholism). Results indicated that adolescents who had an alcoholic parent reported relatively higher levels of alcohol consumption. Heavier use of technology (particularly text messaging, e-mailing/IMing, and watching television) also was related to earlier and heavier substance use during adolescence. Moreover, these effects tended to be more pronounced in adolescents with an alcoholic parent. Results from this study suggest that high levels of technology use during adolescence may be related to an increased risk of alcohol and cigarette use, particularly for children of alcoholic parents (COAs).

Keywords

adolescence; alcohol; cigarettes; substance use; COAs; technology

1. Introduction

During adolescence, numerous changes take place within the individual (e.g., puberty, identity exploration, cognitive development) and in the individual's contexts (e.g., family, peers, school) (Smetana, Campione-Barr, & Metzger, 2006; Spear, 2000). For some adolescents, it is challenging to adjust to all of these rapidly occurring changes. Subsequently, it is not surprising that during adolescence, psychosocial problems, including the initiation and escalation of substance use, become more prevalent (Johnston, O'Malley, Bachman, & Schulenberg, 2007).

One group that is especially at risk for substance use problems during adolescence is children of alcoholic parents (COAs). COAs have been found to experiment with alcohol and drugs at a younger age in comparison to non-COAs (Chassin et al., 2002; Dawson, 2000). COAs also have been found to use tobacco earlier than non-COAs (Cuijpers & Smit, 2002). This is troublesome because research has shown that adolescents who have an early onset of substance

^a Corresponding Author; Department of Human Development & Family Studies, 110 Alison Hall, University of Delaware, Newark, DE 19716; phone: 302-831-3631; fax: 302-831-8776; e-mail: E-mail: ohanness@udel.edu.

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use are more likely to develop substance abuse or dependence than those who initiate substance use later (Chassin and Ritter, 2001; Prescott and Kendler, 1999). Consistent with this research, COAs have been found to have an elevated risk for the development of substance use problems (Ohannessian, Hesselbrock, Kramer, Kuperman, Bucholz, Schuckit, & Nurnberger, 2005; Walden, Iacono, & McGue, 2007).

Importantly, not all COAs develop substance use problems. Therefore, it is important to examine variables that may moderate the relationship between parental alcoholism and adolescent substance use. With the exception of the family environment, the role that contextual moderators play in the relationship between parental alcoholism and adolescent substance use has been relatively unexplored. However, one context that is becoming increasingly central to the lives of adolescents today and needs immediate attention is the world of technology (Gross, Juvonen, & Gable, 2002).

Currently, the limited literature on the relationship between technology use and adolescent adjustment is mixed. Some research has suggested that technology use during adolescence may be negatively related to adjustment. For example, time spent watching television, playing video games, playing computer games, and talking on the phone has been found to be inversely associated with academic performance (Durkin and Barber, 2002; Gentile et al., 2004). Playing violent video games also has been found to be related to aggressive behavior (Anderson & Bushman, 2001; Gentile et al., 2004). In addition, the use of the Internet has been linked to adolescent psychological problems (loneliness, depression, anxiety) (Kraut et al., 1998). However, the use of technology also may be linked to positive adjustment. For example, playing computer games and video games has been found to be associated with enhanced visual processing and cognitive skills (Green & Bavelier, 2007; Subrahmanyam et al., 2001). Online communication also has been positively associated with reported closeness to friends (Valkenburg & Peter, 2007).

As such, it is quite plausible that technology use protects some adolescents from developing problems. For instance, certain types of technology (e.g., video games, watching television, surfing the web) may provide some adolescents with a means to disengage or psychologically escape from their problems. Other types of technology (e.g., IMing, e-mailing, texting) may “protect” an adolescent from experiencing problems by increasing perceived peer support, which according to coping theories (e.g., Carver, Scheier, and Weintraub, 1989) may be adaptive by allowing an individual to vent their feelings, and receive reassurance and advice. Because different types of technology may serve different functions for adolescents, it is important to separately examine their associations with adolescent adjustment.

To date, few studies have focused on e-mailing or instant messaging and none have examined the association between text messaging and adjustment during adolescence. The relationship between technology use and other indicators of adjustment problems during adolescence, such as substance use, also has not been thoroughly investigated. Therefore, a goal of this study was to assess the relations between different types of technology use and adolescent substance use. A secondary goal was to examine whether technology use during adolescence protects or exacerbates involvement in problem behaviors for those who are most at risk, such as children of alcoholic parents (COAs). In sum, the following research questions were addressed 1) Is technology use related to adolescent substance use (alcohol and cigarette use)? and 2) Does technology use moderate the relationship between parental alcoholism and substance use (alcohol and cigarette use) during adolescence?

2. Method

2.1. Participants

The sample included 328 14-16 year-old adolescent girls (58%) and boys. All of the participants were 9th or 10th grade students attending a public high school in the Mid-Atlantic region of the United States. The mean age of the adolescents was 14.99 (SD=.70). Forty-one percent of the adolescents were Caucasian, 22% were African American, 24% were Hispanic, and 5% were Asian (the remaining adolescents chose “other” to describe their race/ethnicity).

2.2. Measures

2.2.1. Parental alcohol problems—*The Children of Alcoholics Screening Test-6* (CAST; Jones, 1981) was used to assess parental alcohol problems. An adolescent who had a biological father or biological mother with a CAST-6 score of 2 or greater was classified as having a biological alcoholic parent. A cut-off of 2 has been shown to be ideal for detecting parental alcoholism in regard to reliability, and the percentage of false positives and false negatives (Hodgins, Maticka-Tyndale, El-Guebaly, & West, 1995). Previous research (Clair & Genest, 1992; Hodgins et al., 1995) has supported the validity and reliability of this measure.

2.2.2. Adolescent technology use—The adolescents were asked to report how much time they spent watching television, text messaging, e-mailing/IMing, talking on the phone, playing video games (PlayStation, Nintendo, Game Boy, Xbox, etc.) or computer games, and surfing the web “on an average/typical day.” The response scale ranged from 1 = *none* to 6 = *4 or more hours a day*. Based on the naturally bimodal distribution of many of these variables, these variables were dichotomized.

2.2.3. Adolescent substance use—All of the adolescents were asked how much (on the average day) they usually drank beer, wine, and liquor in the last six months. The response scale ranged from 0 = *none* to 8 = *more than 8 cans/bottles, glasses, or drinks per day*. A total consumption score was calculated based on these variables. This score was transformed using a logarithmic transformation to adjust for skewness. The adolescents also were asked to report whether they had ever smoked cigarettes, and if so, how old they were when they smoked their first cigarette. This variable was coded so that 1 = *under 10*, 2 = *10-11*, 3 = *12-13*, 4 = *14-15*, and 5 = *never/ not yet*.

2.3. Procedure

The study was approved by the University of Delaware Human Subjects Committee (Approval # HS 09-019). In the spring of 2006, adolescents who provided assent, and whose parents also provided consent, were administered a survey in school by trained research personnel. The survey, which included the measures just described, took approximately 40 minutes to complete. Upon completion of the survey, the adolescents were given a movie pass for their participation.

3. Results

Factorial ANOVA models were conducted to examine the relations between technology use and substance use. The design factors in these analyses were parental alcoholism, gender, and the technology use variables. The dependent variables were alcohol consumption and smoking age of onset. Separate models were conducted for each measure of technology use.

3.1. Television viewing

The alcohol consumption model was not significant ($F(7,267) = 1.12, p=.35, \eta^2=.03$). In contrast, the cigarette smoking model was significant ($F(7,286) = 2.56, p<.05, \eta^2=.06$). Television viewing was not directly related to smoking. However, a significant two-way interaction was found between television viewing and gender ($F(1,286) = 8.30, p<.01, \eta^2=.03$), indicating that smoking onset was earliest for boys who reported high levels of television viewing (3 hours or more a day). A significant three-way interaction between parental alcoholism, gender, and television viewing also was found ($F(1,286) = 6.06, p<.05, \eta^2=.02$), suggesting that this effect was especially pronounced in boys with an alcoholic parent.

3.2. Text Messaging

The alcohol consumption model was significant ($F(7,266) = 2.67, p<.05, \eta^2=.07$). A significant main effect was found for parental alcoholism ($F(1,266) = 5.27, p<.05, \eta^2=.02$), indicating that adolescents with an alcoholic parent consumed more alcohol than those without an alcoholic parent. A significant main effect also was found for text messaging ($F(1,266) = 14.14, p<.001, \eta^2=.05$), suggesting that adolescents who reported high levels of text messaging (one hour or more a day) consumed more alcohol than those who reported lower levels of text messaging. In addition, a significant two-way interaction between parental alcoholism and text messaging was observed ($F(1,266) = 4.25, p<.05, \eta^2=.02$), indicating that adolescents who had an alcoholic parent and reported high levels of text messaging had the highest alcohol consumption levels (see Figure 1).

The cigarette smoking model was not significant ($F(7,285) = .98, p=.45, \eta^2=.02$).

3.3. E-mailing and IMing

The alcohol consumption model was significant ($F(7,265) = 2.49, p<.05, \eta^2=.06$). A significant main effect for parental alcoholism again was found. A significant main effect also was found for e-mailing/IMing ($F(1,265) = 7.47, p<.01, \eta^2=.03$), indicating that adolescents who reported high levels of e-mail/IM use (one hour or more a day) consumed more alcohol than those who reported lower levels of e-mail/IM use.

The cigarette smoking model also was significant ($F(7,284) = 2.32, p<.05, \eta^2=.05$). Similar to the previous model, a significant main effect for e-mailing/IMing was observed ($F(1,284) = 4.04, p<.05, \eta^2=.01$). A significant interaction between parental alcoholism and e-mailing/IMing also was found ($F(1,284) = 6.89, p<.02$), suggesting that adolescents with an alcoholic parent who reported high levels of e-mail/IM use began smoking at a younger age than those with an alcoholic parent who used e-mail/IM less and those without an alcoholic parent (see Figure 2).

The alcohol consumption and the smoking models were not significant for playing video games, talking on the phone, or surfing the web. Chi-square tests were conducted for the technology use variables that were significant (television viewing, text messaging, and e-mailing/IMing), by gender. The results of these tests indicated that television viewing was not significantly related to text messaging or to e-mailing/IMing for boys or girls. Text messaging and e-mailing/IMing were significantly related for boys ($X^2(1)=8.01, p<.01$) and for girls ($X^2(1)=15.89, p<.001$). However, as discussed previously, slightly different patterns of relations were found for text messaging and e-mailing/IMing in the alcohol and cigarette models.

4. Discussion

The present study extends the growing literature because it includes types of technology that are rapidly becoming central in the lives of adolescents – specifically text messaging, e-mailing, and instant messaging. Moreover, this study focused on substance use, a previously neglected, but important, indicator of adolescent adjustment. Consistent with the literature (Chassin et al., 2004), COAs reported higher alcohol consumption levels than non-COAs. Results from this study also indicate that heavy use of technology may be negatively related to adolescent adjustment. More specifically, high levels of text messaging and e-mailing/IMing were associated with relatively higher levels of alcohol consumption. In addition, high levels of e-mailing/IMing were related to an earlier onset of cigarette smoking. These results are consistent with studies that have indicated that the use of certain types of technology may be negatively related to adolescent adjustment (Durkin and Barber, 2002; Gentile et al., 2004; Kraut et al., 1998). These findings also suggest that parents and teachers should be more mindful of the amount of time that their children are using technologies such as text messaging and e-mail.

It is important to note that in the present study, none of the technology use variables were found to serve as a “protective” factor. In contrast, some of the types of technology examined appeared to elevate the risk of alcohol and cigarette use among COAs. For example, COAs who had high levels of text messaging had the highest levels of alcohol consumption. Similarly, COAs who reported high levels of e-mail/IM use had the earliest onset of smoking. Male COAs who reported high levels of television viewing also were at an increased risk for an early onset of cigarette smoking. In sum, for COAs, the use of technology appeared to exacerbate their risk of early and heavier substance use.

It is essential that future research explores the underlying mechanisms involved in the relation between technology use and adolescent substance use, particularly in COAs and other high-risk groups. Perhaps peer relations mediate the relationship between the more socially-based types of technology (e.g., e-mailing, IMing, text messaging) and adolescent substance use. This type of mediation may be particularly important for adolescents who are experiencing family problems, such as COAs. Of note, playing video games and surfing the web (which are less socially-based types of technology) were not associated with alcohol or cigarette use. Clearly, it would be important for future research to thoroughly address the links between technology use, peer characteristics, and substance use during adolescence.

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Figure 1. Alcohol Consumption by Parental Alcoholism and Text Messaging

Figure 2. Smoking Onset (1=Under 10, 2=10-11, 3=12-13, 4=14-15, and 5=Never) by Parental Alcoholism and E=Mailing/IMing