

## Original Investigation

# Examining unsupervised time with peers and the role of association with delinquent peers on adolescent smoking

Kathryn Greene & Smita C. Banerjee

## Abstract

**Introduction:** This study explored the association between unsupervised time with peers and adolescent smoking behavior both directly and indirectly through interaction with delinquent peers, social expectancies about cigarette smoking, and cigarette offers from peers.

**Methods:** A cross-sectional survey was used for the study and included 248 male and female middle school students.

**Results:** Results of structural equation modeling revealed that unsupervised time with peers is associated indirectly with adolescent smoking behavior through the mediation of association with delinquent peers, social expectancies about cigarette smoking, and cigarette offers from peers.

**Discussion:** Interventions designed to motivate adolescents without adult supervision to associate more with friends who engage in prosocial activities may eventually reduce adolescent smoking. Further implications for structured supervised time for students outside of school time are discussed.

## Introduction

Each week, in the United States, 3.3 million children under age 13 are left without adult supervision (Vandivere, Tout, Zaslow, Calkins, & Capizzano, 2003). This number increases dramatically when children reach adolescence. In fact, Cohen, Farley, Taylor, Martin, and Schuster (2002) reported that out of 2,034 high school boys and girls surveyed, 56% reported being home after school without an adult present for 4 or more hours per day. Unsupervised time presents adolescents with opportunities to engage in a range of potential problem behaviors such as cigarette smoking, drinking alcohol, and smoking marijuana (Cohen et al., 2002).

When adolescents are not in school, their chance of being left unsupervised is high. Colwell, Pettit, Meece, Bates, and Dodge

(2001) reported that unsupervised time during the first months of summer vacation is a period of increased danger for smoking initiation. The significantly lower smoking rates during September seem to be related to the beginning of school. This finding suggests that spending unsupervised time may be problematic from a public health perspective because it presents opportunities for adolescents to initiate or engage in risk behaviors (Cohen et al., 2002). Warr (2005) has argued that it is not just unsupervised time, but unsupervised time in the company of certain peers, that is problematic. Research has suggested that unstructured activities with peers in the absence of an authority figure contribute to delinquent behaviors (e.g., Haynie & Osgood, 2005; Osgood & Anderson, 2004; Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996). Because adolescent smoking is a social behavior and adolescents' early smoking often begins with peers (McVie & Bradshaw, 2005), it is likely that, when adolescents are left alone with peers, they may perform behaviors that are considered "taboo" for their age group, such as smoking. However, the multiple pathways of association from unsupervised time with peers to adolescent smoking are unclear. This paper examines both direct and indirect associations of unsupervised time with peers on adolescent cigarette smoking.

## Direct association between unsupervised time with peers and smoking

Unsupervised time with peers contributes favorably to delinquency, substance use, and sexual behaviors in adolescents (e.g., Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007; Bauer, 2006; Cohen et al., 2002; Posner & Vandell, 1999). Barnes et al. (2007) examined a variety of time-use categories, including homework, extracurricular activities, sports time, paid work, housework, and television viewing, as well as indices of family time and unsupervised peer time, for their effects on heavy alcohol use, cigarette smoking, illicit drug use, delinquency, and sexual activity. The results suggested that family time served as a protective factor against all five problem behaviors, whereas unsupervised time with peers was a significant risk factor for all five problem behaviors. Thus, based on a number of studies, it

Kathryn Greene, Ph.D., *Department of Communication, Rutgers University, New Brunswick, NJ*  
Smita C. Banerjee, Ph.D., *Lincoln School of Health & Social Care, University of Lincoln, Lincoln, Lincolnshire, UK*

### Corresponding Author:

Kathryn Greene, Ph.D., *Department of Communication, Rutgers University, 4 Huntington Street, New Brunswick, NJ 08901, USA.*  
Telephone: 732-932-7500. Fax: 732-932-3756. Email: [kgreene@scils.rutgers.edu](mailto:kgreene@scils.rutgers.edu)

doi: 10.1093/ntr/ntp003

Received 10 March 2008; accepted 19 September 2008

© The Author 2009. Published by Oxford University Press on behalf of the Society for Research on Nicotine and Tobacco.  
All rights reserved. For permissions, please e-mail: [journals.permissions@oxfordjournals.org](mailto:journals.permissions@oxfordjournals.org)

## Unsupervised time with peers and smoking

can be concluded that the amount of unsupervised time spent with peers is positively associated with cigarette smoking.

### Mediated associations between unsupervised time with peers and smoking

Research indicates that a direct relationship exists between the time an adolescent is left unsupervised with peers and substance use, including smoking. However, the pathways through which this relationship might be mediated are less clear. We aimed to unpack the mediated pathways of influence that make unsupervised time with peers conducive for smoking initiation. In particular, we propose that the relationship between unsupervised time with peers and adolescent smoking will be mediated through association with deviant peers, cigarette offers made by peers, and social expectancies about cigarette smoking. Figure 1 represents the proposed model. Besides the direct association between unsupervised time with peers and cigarette smoking (Path 1), we propose four mediated pathways of influence between unsupervised time with peers and adolescent cigarette smoking. These pathways of influence (Paths 2–5) are described here, and research in the area is reviewed.

### Path 2: unsupervised time with peers, association with delinquent peers, and adolescent smoking

The type of peers with which adolescents spend most time affects their behaviors. Warr (2005) examined the reasons why some adolescents acquire delinquent friends, whereas others do not by surveying 1,738 parents and 929 adolescents. The findings confirmed that adolescents who spend unsupervised time with their peers are more likely to make friends with delinquent peers than are adolescents who do not get much unsupervised time with peers. Therefore, we propose that unsupervised time with peers will be positively related to association with delinquent peers.

Association with delinquent peers also contributes to smoking intention and behavior (e.g., Brook, Balka, Rosen, Brook, & Adams, 2005; DuBois & Silverthorn, 2004; Ellickson, Tucker, & Klein, 2001; Frauenglass, Routh, Pantin, & Mason, 1997; Simantov, Schoen, & Klein, 2000). Compared with nonsmokers, adolescent smokers report greater association with peers who steal, sell drugs, or engage in other delinquent behaviors. Using a social network analysis, Ennett et al. (2006) concluded that adolescents in closer proximity to peers who are substance users themselves had a higher propensity of using substances, including cigarettes. Therefore, based on prior research, we propose that association with delinquent peers will be positively related to adolescent cigarette smoking.

### Path 3: unsupervised time with peers, cigarette offers, and adolescent smoking

Colwell, Ramirez, Koehly, Stevens, and Smith (2006) suggested that the association between the amount of time spent in unsupervised peer settings and exposure to delinquent peers in early adolescence may reflect the operation of a selection factor, whereby adolescents “hanging out” with antisocial peers may avoid activities and settings where adult supervision is likely to be present. Additionally, in the absence of structured activities for adolescents, they have an opportunity to associate with other peers who might be separate from their “ordinary realm” of friends. Peer cluster theory suggests that members of the peer cluster are not passive participants who are influenced by others but themselves contribute to development of peer cluster norms and behaviors (Oetting & Beauvais, 1986). Therefore, when left unsupervised, adolescents may be seeking “excitement” and end up “hanging out” with other adolescents who are able to provide and offer cigarettes and other substances that are not easily available to teens. Therefore, we propose that unsupervised time with peers will be positively related to cigarette offers made by peers.

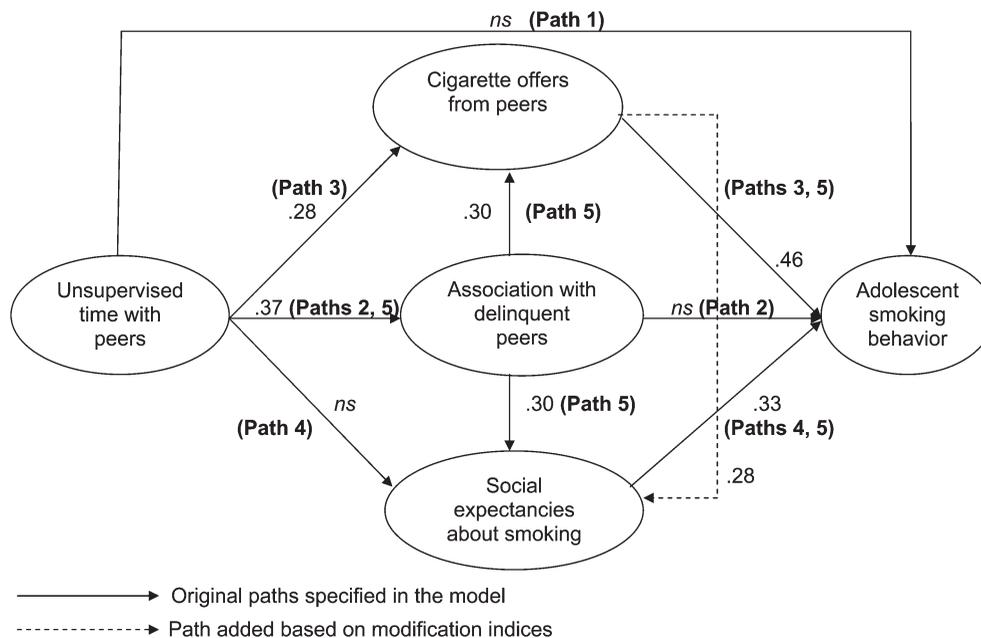


Figure 1. Final model for associations between unsupervised time with peers and adolescent cigarette smoking behavior.

Peer pressure plays a key role in adolescent cigarette smoking initiation and continued use. Cigarette offers from peers have been positively related to early smoking initiation and to adolescent smoking and negatively related to quit attempts (e.g., Ellickson, Orlando, Tucker, & Klein, 2004; Sussman, Dent, Severson, Burton, & Flay, 1998). Therefore, based on past research, we propose that cigarette offers from peers will be positively associated with adolescent cigarette smoking.

#### **Path 4: unsupervised time with peers, social expectancies, and adolescent smoking**

Unsupervised time with peers may provide an adolescent with opportunities to engage in conversations and discussions that provide positive reinforcement for substance use, particularly smoking (see Dishion, Spracklen, Andrews, & Patterson, 1996). Discussion topics, within which values and attitudes are embedded, can provide positive (or negative) reinforcement for substance abuse. Unsupervised time with peers might lead to beliefs and expectancies that are favorable for cigarette smoking, presumably because adolescents who are spending more unsupervised time with peers might be witnessing, reading, or talking about taboo behaviors, such as adolescent smoking, that are leading to the formation of favorable social expectancies about cigarette smoking. Therefore, we propose that unsupervised time with peers will be positively related to social expectancies about cigarette smoking.

Smoking-related expectancies assess participants' beliefs about the results of substance use (here, smoking; Austin, Pinkleton, & Fujioka, 2000). Research indicates that social expectancies strongly predict behavior (e.g., Austin & Knaus, 2000; Austin, Pinkleton, Hust, & Cohen, 2005). For smoking in particular, social expectancies that assess beliefs about the social benefits of smoking (i.e., being cool or popular) have been directly related to adolescent smoking behavior among inner-city adolescents (e.g., Epstein, Griffin, & Botvin, 2000). The preceding discussion demonstrates that smoking-related beliefs or expectancies are positively associated with adolescents' smoking behavior. Therefore, we propose that social expectancies about cigarette smoking will be positively associated with adolescent cigarette smoking.

#### **Path 5: unsupervised time with peers, association with delinquent peers, cigarette offers, social expectancies, and adolescent smoking**

We already hypothesized that unsupervised time with peers might lead to association with delinquent peers, which might then contribute to adolescent smoking. We propose two additional mediators in this relationship: cigarette offers and social expectancies (mediating the relationship between association with delinquent peers and adolescent smoking). Although research has examined direct associations between many of the above-stated variables, little research informs us about the role of mediators in the proposed pathways of influence.

In the context of cigarette smoking, therefore, it appears that adolescents spending unsupervised time with delinquent peers may be more prone to smoking cigarettes. One possible

explanation is that when adolescents are with delinquent peers, they are socialized into forming favorable attitudes and expectancies about cigarette smoking and other substances (Barnes et al., 2007). When a behavior is observed and socially sanctioned within a prescribed milieu (e.g., home, neighborhood, and community), it tends to be associated with fewer perceived risks and its likelihood of adoption increases in children and adolescents (Levitt, Selman, & Richmond, 1991). Levitt et al. (1991) concluded that "in some urban settings, the freedom given to young people to wander in a variety of built environments and contexts creates settings allowing experimentation with various types of unhealthy practices without parental checks and balances being readily available" (p. 349).

Theoretical support for delinquent peer influences can be found in prior research. Differential association theory (Sutherland, 1947) and social learning theories (Akers, 1998) propose that delinquent behaviors are learned when one acquires delinquent friends. Through such associations with delinquent friends, the individual learns attitudes and beliefs that are favorable to substance use (see Yanovitzky, 2005). Furthermore, Sutherland and Cressey (1978) argued that associations with delinquent peers result in both reinforcement of delinquent beliefs and delinquent behaviors. Another theory that explains how peer influences lead to substance abuse is the peer cluster theory (Oetting & Beauvais, 1986). The peer cluster theory posits that substance use occurs in the presence of peers, through peer encouragement, peer modeling, tolerant atmosphere for substance abuse, discussions about substance use, and provision or availability of substances (Oetting & Beauvais, 1986). These theories suggest that greater association with delinquent peers will be related to more favorable social expectancies about cigarette smoking and more cigarette offers by peers. Therefore, based on prior research, we proposed that association with delinquent peers would be positively related to cigarette offers made by peers. Furthermore, association with delinquent peers would be positively related to social expectancies about cigarette smoking.

#### **Possible associations among variables**

This paper examines the hypotheses advanced. As a starting point, it indicates the linear associations between unsupervised time with peers and adolescent cigarette smoking in one of five ways. First, unsupervised time with peers may be associated with adolescent smoking directly (Path 1). Second, unsupervised time with peers may positively correlate with association with delinquent peers, which in turn is positively associated with adolescent cigarette smoking (Path 2). Third, unsupervised time with peers may be positively associated with cigarette offers made by friends, which in turn is positively associated with adolescent cigarette smoking (Path 3). Fourth, unsupervised time with peers may be positively associated with favorable social expectancies about cigarette smoking, which will also be positively related to adolescent smoking (Path 4).

However, unsupervised time with peers also may be associated indirectly with cigarette offers made by peers to the extent that unsupervised time with peers motivates association with delinquent peers and this association, in turn, is positively related to cigarette offers made by peers (Path 5). Similarly, unsupervised time with peers may be associated indirectly with social expectancies about cigarette smoking to the extent that unsupervised time with peers motivates association with delinquent

## Unsupervised time with peers and smoking

peers and this association, in turn, is positively related to favorable social expectancies about cigarette smoking (Path 5). Therefore, we tested the proposition that the association of unsupervised time with peers with adolescent cigarette smoking occurs in both direct and indirect contexts by inclusion of association with delinquent peers, cigarette offers made by peers, and social expectancies about cigarette smoking.

## Methods

### Participants and procedure

After receiving human subjects approval from the Rutgers University Institutional Review Board, parental consent from students' parents, and verbal consent from the students, 260 (104 males and 156 females) students from two schools in the northeastern United States were recruited for the study. The students were informed about a study based on smoking among middle school students, and a letter was sent home with students to obtain parental consent for the study. Once the students brought back the signed parental consent forms, they were informed of the procedures involved in the study (parents of only 3 out of 260 students refused to let their child participate in the study; these students were sent to the library/computer laboratory when the other students participated in the study sessions). The students were told that participation would involve filling out a questionnaire about attitudes and behaviors. There was a 100% cooperation rate from the students, and no one declined to participate in the study. Once consent was obtained from both parents and students, students were given paper-and-pencil questionnaires in the classrooms. The questionnaires were distributed by one of the coauthors, and the class teacher was always present. The students were informed that their responses were anonymous.

Missing data ( $n=12$ ) were deleted from analyses. The final data comprised 247 students (97 males and 150 females), ranging in age from 11 to 15 years ( $M=12.49$ ,  $SD=1.04$ ). The sample was predominantly Hispanic (74%), with 14% Black and less than 3% each in other categories. The students completed the surveys in their classrooms as part of a larger longitudinal smoking intervention project. The questionnaire took less than 40 min to complete and was anonymous.

### Measurement instruments

The primary independent variable in the study was unsupervised time with peers, and the dependent variable was adolescent smoking behavior. Association with delinquent peers, cigarette offers made by peers, and social expectancies about cigarette smoking were mediating variables examined in the study.

The present study used both single-item and multiple-item measures. The single-item measures consisted of unsupervised time with peers and adolescent smoking behavior. The multiple-item measures consisted of association with delinquent peers, cigarette offers, and social expectancies about cigarette smoking. After confirming the unidimensionality of each of the multiple-item scales, we created respective composite scores by summing and averaging responses to individual items. The resulting measures are described in the following sections.

**Unsupervised time with peers.** The measure of unsupervised time with peers was developed by the authors and included one item that asked, "How often do you spend your free time in the afternoons or evenings hanging out with friends without adults around?" Responses ranged from 1 (never) to 5 (always). A higher score indicated greater unsupervised time spent with peers ( $M=2.80$ ,  $SD=1.27$ ).

**Association with delinquent peers.** The measure of association with delinquent peers scale was derived from Yanovitzky (2005) and adapted from the delinquency scale developed by Greene, Krcmar, Walters, Rubin, and Hale (2000). The instructions stated, "In the last 7 days, how many times did you hang out (get together) with friends who...." The scale consisted of 11 five-point Likert-type items ranging from 1 (never) to 5 (7 or more times) such as "get into trouble a lot," "fight a lot," "take things that don't belong to them," and "have been in a physical fight." Reliability for this scale was good (Cronbach's  $\alpha=.93$ ), and the items were summed and averaged to create a higher score indicating greater frequency of association with delinquent peers ( $M=1.98$ ,  $SD=0.96$ ).

**Cigarette offers from peers.** The measure of cigarette offers from peers was developed by the authors and included two items that asked, "Have your peers offered you cigarettes?" and "Have other kids offered you cigarettes?" Responses included 0 (no) and 1 (yes). The two items were summed; a higher score indicated more cigarette offers made by peers ( $M=0.32$ ,  $SD=0.62$ , range=0–2).

**Social expectancies about cigarette smoking.** The measure of social expectancies about cigarette smoking was adapted from Austin et al. (2000) and consisted of four 5-point Likert-type items that asked the respondents to agree or disagree with the following statements: "Most teens smoke," "Smoking is like a reward," "Smoking is part of a good party," and "Smoking together with friends is a sign of good friendship." Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Reliability was moderate (Cronbach's  $\alpha=.76$ ), and a higher score indicated more favorable social expectancies about cigarette smoking ( $M=2.20$ ,  $SD=0.72$ ).

**Smoking behavior.** Smoking behavior was assessed by four items developed by the authors: (a) "Have you ever smoked part or all of a cigarette?" with answer options ranging from 0 (no) to 1 (yes;  $M=0.22$ ,  $SD=0.41$ ); (b) "How often have you smoked all or part of a cigarette?" with five answer options: 0 (I have never smoked a cigarette), 1 (once or twice but not in the last 30 days), 2 (more than twice in the past but not in the last 30 days), 3 (regularly in the past but not in the last 30 days), and 4 (I have smoked in the last 30 days); (c) "How long has it been since you last smoked part or all of a cigarette?" with four answer options: 0 (never smoked), 1 (more than 6 months ago), 2 (more than 30 days ago but within the last 6 months), and 3 (during the last 30 days); and (d) "What is your best guess of the number of days you smoked part or all of a cigarette during the last 30 days?" Participants were instructed to write their response on a blank line ( $M=0.73$ ,  $SD=3.52$ , range=0–30). The scores on these items were first converted to  $z$  scores (to create a standardized measurement unit for every item because the items had different response formats) and then added and averaged to create a variable for adolescent smoking behavior (Cronbach's

alpha = .60). A higher score on the variable indicated more adolescent smoking behavior ( $M = 0.00$ ,  $SD = 1.00$ , range =  $-0.41$  to  $3.57$ ).

### Data analyses

To test these cross-sectional data, we used bivariate correlations and structural equation modeling (SEM). The SEM tested the comparative utility of unsupervised time with peers for understanding adolescent smoking behavior, along with the mediating roles of association with delinquent peers, social expectancies about cigarette smoking, and cigarette offers from peers.

## Results

### Preliminary analyses

Before testing our hypotheses, we conducted preliminary analyses. We evaluated sex, age, race, school, and grade differences on all the variables in the study by conducting appropriate  $t$  tests (for sex, race, and school) or one-way analyses of variance (ANOVAs; for age and grade). This technique has been used to identify demographic differences in the variables of interest (see Knobloch, Solomon, & Cruz, 2001). Table 1 presents the results of the  $t$  tests (for examining sex, race, and school differences in study variables), and Table 2 presents the results of the ANOVAs (for examining grade and age differences in study variables). Results of  $t$  tests documented two significant findings: (a) male adolescents reported greater smoking behavior than did female adolescents and (b) students from school B reported greater positive expectancies (favorable to smoking) for cigarette smoking than did students from school A. Results of ANOVAs indicated significant findings consistent across grade and age: (a) eighth-grade students reported more unsupervised time, receiving more cigarette offers, and more cigarette smoking as compared with sixth- and seventh-grade students and (b) 15-year-old adolescents reported more unsupervised time, receiving more cigarette offers, and more cigarette smoking as compared with 12, 13, and 14 year-olds.

### Main analyses

We conducted two sets of analyses to evaluate hypotheses. First, we computed zero-order correlations for all the study variables (Table 3). Results of bivariate correlations demonstrated that adolescent cigarette smoking was positively associated with unsupervised time with peers, association with delinquent peers, social expectancies about cigarette smoking, and cigarette offers from peers. Results also revealed that unsupervised time with

peers was positively related to association with delinquent peers, social expectancies about cigarette smoking, and cigarette offers from peers. Furthermore, association with delinquent peers was positively related to social expectancies about cigarette smoking and cigarette offers from peers.

Next, we used maximum likelihood SEM to evaluate our hypotheses further. The first step required calculation of the error variance ( $1 - \alpha$ ) ( $\sigma^2$ ) of each multiple-item variable to account for unreliability within our measures (Bollen, 1989). Because our preliminary analyses identified several sex, age, school, and grade differences in measures, we first partialled the variance due to respondents' sex, age, school, and grade from all measures utilized in the model.

We created our structural model by constructing the paths predicted by our hypotheses (see Figure 1). Results of the SEM indicated that our original model did not adequately fit the data,  $\chi^2(1) = 16.10$ ,  $p < .001$ , comparative fit index (CFI) = 0.95, root mean squared error of approximation (RMSEA) = 0.25. To improve the fit of the model, we first removed insignificant paths, one at a time. We eliminated the following three paths (in this order) from our structural model: (a) the path from association with delinquent peers to cigarette smoking (Path 2—second half), (b) the path from unsupervised time with peers to cigarette smoking (Path 1), and (c) the path from unsupervised time with peers to social expectancies about cigarette smoking (Path 4—first half). The fit of this model was not improved,  $\chi^2(4) = 25.43$ ,  $p < .001$ , CFI = 0.93, RMSEA = 0.15, because elimination of paths in structural equation analysis may not always result in an adequately fit model (see Knobloch et al., 2001). Next, we added paths based on modification indices. Before adding the path, we confirmed that a theoretical rationale guided this new addition. Thus, a path was added from cigarette offers from peers to social expectancies about cigarette smoking. Inclusion of this path resulted in a model that adequately fit the data,  $\chi^2(3) = 5.31$ ,  $p = .15$ , CFI = 0.99, RMSEA = 0.06. We conducted post-hoc power analysis to understand the magnitude of our findings. Using G\*Power (version 3), we tested the power for conducting goodness-of-fit tests (see Faul, Erdfelder, Lang, & Buchner, 2007). The power detected for the effect size of .28 (lowest significant effect size estimate) for a sample of 260 at  $p < .01$  was 0.92 and for the effect size of 0.46 at  $p < .001$  was 0.99.

The final model is presented in Figure 1. The SEM results overall are consistent with our hypotheses regarding the factors shaping the relationship between unsupervised time with peers

**Table 1. Sex, race, and school differences in study variables**

Variable	Sex differences			Race differences			School differences		
	Males	Females	$t(245)$	Hispanic	Other	$t(245)$	School A	School B	$t(245)$
Unsupervised time	2.97 (1.23)	2.69 (1.30)	1.67	2.73 (1.29)	2.98 (1.22)	1.36	3.03 (1.17)	2.70 (1.31)	1.92
Association with delinquent peers	1.98 (0.91)	1.99 (1.01)	-0.12	1.92 (0.94)	2.19 (1.03)	1.89	1.87 (0.86)	2.04 (1.02)	-1.32
Social expectancies	2.20 (0.71)	2.21 (0.73)	-0.13	2.18 (0.69)	2.30 (0.81)	1.14	2.06 (0.65)	2.28 (0.75)	-2.20*
Peer cigarette offers	0.35 (0.63)	0.30 (0.61)	0.59	0.31 (0.61)	0.34 (0.65)	0.36	0.40 (0.65)	0.28 (0.60)	1.34
Adolescent smoking	0.68 (3.93)	-0.45 (2.68)	2.68**	-0.05 (3.19)	0.15 (3.54)	0.43	0.35 (3.53)	-0.16 (3.15)	1.13

Note. \* $p \leq .05$ ; \*\* $p \leq .01$ .

**Table 2. Grade and age differences in study variables**

Variable	Grade differences				Age differences (years)					
	Sixth	Seventh	Eighth	F(2, 244)	11	12	13	14	15	F(4, 242)
Unsupervised time	2.55 (1.35)	2.62 (1.23)	3.28 (1.11)	8.25***	2.32 (1.29)	2.52 (1.18)	3.00 (1.22)	3.41 (1.19)	4.25 (0.96)	7.50***
Association with delinquent peers	1.98 (0.94)	1.90 (0.90)	2.09 (1.08)	0.74	2.03 (0.98)	1.91 (0.88)	2.02 (1.08)	2.03 (1.01)	2.07 (0.53)	.19
Social expectancies	2.29 (0.75)	2.18 (0.66)	2.14 (0.75)	0.98	2.36 (0.82)	2.23 (0.61)	2.10 (0.74)	2.20 (0.76)	2.06 (0.80)	1.00
Peer cigarette offers	0.24 (0.50)	0.23 (0.57)	0.51 (0.74)	5.59**	0.19 (0.50)	0.25 (0.56)	0.28 (0.54)	0.57 (0.80)	1.25 (0.96)	5.16***
Adolescent smoking	-0.38 (3.23)	-0.47 (2.65)	0.96 (3.77)	4.86**	-0.32 (3.31)	-0.41 (2.94)	0.02 (3.09)	0.75 (3.44)	4.03 (7.53)	2.56*

Note. \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .

and adolescent cigarette smoking. To summarize, SEM demonstrated the following: (a) Path 1 (not supported): unsupervised time with peers was not associated with adolescent smoking behavior directly; (b) Path 2 (partially supported): unsupervised time with peers was positively related to association with delinquent peers, but association with delinquent peers was not related to adolescent smoking behavior; (c) Path 3 (supported): unsupervised time with peers was positively related to cigarette offers made by peers, and cigarette offers made by peers were positively related to adolescent cigarette smoking; (d) Path 4 (partially supported): unsupervised time with peers was not related to social expectancies about cigarette smoking, but social expectancies about cigarette smoking were positively associated with adolescent cigarette smoking; and (e) Path 5 (supported): unsupervised time with peers was positively related to association with delinquent peers, association with delinquent peers was positively related to both cigarette offers made by peers and social expectancies about cigarette smoking, and both cigarette offers and social expectancies were positively related to adolescent cigarette smoking.

In combination with the zero-order correlation matrix, the SEM results demonstrated that the positive zero-order correlation between unsupervised time with peers and adolescent cigarette smoking was mediated by association with delinquent peers, social expectancies about cigarette smoking, and cigarette offers from peers.

**Table 3. Zero-order correlation matrix for all variables (N=247)**

	1	2	3	4	5	6	7
1. Adolescent smoking	1.00						
2. Unsupervised time	.37**	1.00					
3. Association with delinquent peers	.38**	.35**	1.00				
4. Social expectancies	.47**	.23**	.42**	1.00			
5. Cigarette offers	.59**	.43**	.39**	.36**	1.00		
6. Age	.16*	.32**	.02	-.10	.23**	1.00	
7. Sex <sup>a</sup>	-.17*	-.11	.01	.01	-.04	-.12	1.00

Note. <sup>a</sup>Sex (1 = male and 0 = female).

\* $p \leq .01$ , \*\* $p \leq .001$ .

## Discussion

The present study examined how unsupervised time with peers is associated with adolescent smoking behavior. Unsupervised time with peers was indirectly associated with adolescent smoking behavior via association with delinquent peers, favorable social expectancies about cigarette smoking, and cigarette offers from peers.

### Direct pathway of influence

The present study demonstrated that unsupervised time with peers does not contribute to adolescent smoking directly. This finding is inconsistent with prior research that suggests that unsupervised time with peers may lead to substance use including cigarettes (e.g., Barnes et al., 2007; Bauer, 2006; Cohen et al., 2002; Posner & Vandell, 1999). However, given the presence of other variables, unsupervised time with peers may contribute to adolescent smoking, albeit indirectly. Some studies do not include tests of mediation. By demonstrating that there exist five pathways of influence (one direct and four mediated) between unsupervised time with peers and adolescent cigarette smoking, this paper provides possible pathways for the association between unsupervised time with peers and adolescent smoking behavior. Because this study used correlational data, we are not predicting causality but rather strong associations between the intended variables.

### Indirect or mediated pathways of influence

First, the present study demonstrated that unsupervised time with peers contributes to association with delinquent peers, a finding that is consistent with prior research (e.g., Colwell et al., 2001; Warr, 2005). However, the study also demonstrates that mere association with delinquent peers does not lead to adolescent smoking. This finding is inconsistent with prior research that suggests that association with delinquent peers may lead to both smoking initiation and behavior (e.g., Brook et al., 2005; DuBois & Silverthorn, 2004; Ellickson et al., 2001; Simantov et al., 2000). We suggest that this finding may be the result of other mediators operating between association with delinquent peers and adolescent smoking that make a direct relationship insignificant.

Second, we found that unsupervised time with peers does not contribute to social expectancies about cigarette smoking but rather that favorable expectancies about cigarette smoking are

significant cross-sectional predictors of adolescent smoking (e.g., Smith & Stutts, 1999; Tickle, Hull, Sargent, Dalton, & Heatherton, 2006). In the absence of adult supervision, adolescents will be more likely to engage in risky behaviors (Bauer, 2006) and formulate positive expectancies about the same. However, a protective factor that seems to dissuade adolescents from engaging in risky behavior is perceived parental trust (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003), which was not examined in the present study.

Third, we found that unsupervised time with peers leads to association with delinquent peers, which is related to both cigarette offers made from peers and social expectancies about cigarette smoking. Furthermore, SEM results suggested that we missed out on specifying one direct relationship, that is, cigarette offers from peers influencing social expectancies about cigarette smoking. Taken together, these findings suggest that peers play a significant role in socialization of youth regarding smoking. Because adolescence is a time when experimentation is likely to occur (Borawski et al., 2003), it follows that when in the company of delinquent peers, adolescents will be more likely to experiment and engage in talks and discussions about cigarette smoking.

Fourth, although the present study suggests that unsupervised time with peers is a problematic social phenomenon, it does not provide enough data to assess what kind of supervision is most beneficial. For instance, Warr (2005) found that both direct supervision (when an adult is physically present) and indirect supervision (when an adult is not physically present but monitors activities from afar, for instance, through telephone contacts) may act to deter adolescents from behaving inappropriately, even when they are left unsupervised with peers. Future research could examine different types of supervision to assess effectiveness.

### Social environmental contexts of Hispanic adolescent smoking

Given that the majority of our study sample was Hispanic, it becomes necessary to discuss the social environmental contexts of Hispanic adolescent smoking. Social environmental influences on Hispanic adolescents' substance use behaviors, including smoking, have been examined previously (e.g., Ebin et al., 2001; Horigian, Lage, & Szapocznik, 2006; Vega, Sribney, & Achara-Abrahams, 2003). A factor consistently shown to have an effect on substance use among Hispanic adolescents is acculturation. Acculturation can be understood as a process by which members of one cultural group adopt the beliefs and behaviors of another group. For Hispanics, acculturation means adopting beliefs and behaviors that conform to the mainstream U.S. way of life (see Horigian et al., 2006). Particularly for Hispanic adolescents, acculturation seems to have an effect on alcohol and drug use, with more-acculturated Hispanics engaging in greater substance use behaviors than less-acculturated Hispanic adolescents (e.g., Ebin et al., 2001; Vega et al., 2003). Additionally, the acculturation stress resulting from conflict of values among the old culture and those of the new culture has an influence on substance use among Hispanic adolescents (Strait, 1999). However, research also has documented that Hispanic youth who develop ethnic pride or bicultural competence are more resilient against substance use than those who do not (e.g., Castro, Boyer, & Balcazar, 2000; Marsiglia, Kulis, Hecht, &

Sills, 2004). More recently, Castro et al. (2006) highlighted the need for examining cultural variables such as adolescent acculturative stress and the differential acculturation between the parent and the adolescent as influential factors for understanding Hispanic adolescent substance use, including smoking. Although the present study demonstrated that, for a largely Hispanic adolescent population, unsupervised time with peers was conducive to adolescent smoking through the way it shapes association with deviant peers, cigarette offers made by peers, and positive social expectancies about cigarette smoking, the present study did not include cultural-specific variables. Therefore, future research could examine the extent to which the present study variables (both direct and indirect pathways from unsupervised time with peers to adolescent smoking) are influenced by cultural factors, particularly in the context of Hispanic adolescent smoking behavior.

### Study implications

The present study demonstrates the importance of modeling pathways of influence from unsupervised time with peers to adolescent cigarette smoking. In particular, this study documents the importance of examining unsupervised time with peers as a potential contributing factor for different adolescent substance behaviors. From a practical perspective, this study suggests that interventions designed to motivate adolescents without adult supervision to associate more with friends who engage in prosocial activities may eventually reduce adolescent smoking. Also, the amount of unsupervised time in which adolescents are left to engage with peers needs monitoring.

The present study also has implications for the development of appropriate supervised experiences for adolescents outside of school. Positive youth development (PYD) is an area of research and practice that emphasizes a strengths-based approach to the promotion of positive outcomes for adolescents and youth (Larson, 2000). After-school programs have been identified as a setting especially suited for PYD interventions (Larson, Hansen, & Moneta, 2006). Tebes et al. (2007) have demonstrated that a PYD intervention that included an evidence-based substance abuse prevention component adapted for an urban after-school setting was effective in preventing adolescent substance use. The intervention also focused on health education and cultural heritage. Given that unsupervised time with peers may be conducive to adolescent smoking (as evidenced from our research findings) and initiation of other problem behaviors, the present research supports the notion of involving adolescents in after-school PYD interventions and examining intended outcomes. Finally, exploration of cultural values and heritage in such after-school PYD intervention programs may be beneficial for a minority population, such as Hispanic adolescents, and this could be explored in future research.

### Limitations and future research

The present study had a number of limitations. The data were collected from two states in the northeastern United States, and it is not known if these results would generalize to other areas of the country. Because the data were collected in mid-sized towns and suburban areas, these results may not generalize to either inner-city or rural populations (e.g., Hispanics residing in the Manhattan metropolitan area vs. Hispanics residing in suburban

## Unsupervised time with peers and smoking

New York vs. Hispanics residing in rural Pennsylvania or in the southwestern United States). These data were primarily from Hispanic adolescents, and other racial groups (e.g., Blacks, Asians, Whites, and bi- or multiracial groups) were underrepresented. However, according to the University of Michigan (2000), 37.9% of White, 27.7% of Hispanic, and 14.3% of Black high school seniors reported using cigarettes in the past 30 days. These differences may be disappearing among junior high school students (Ahern et al., 2000; Centers for Disease Control and Prevention, 2000). Finally, we did not examine culturally specific beliefs such as acculturation and family bonds. Culturally specific beliefs may interact with peer influences differently in influencing adolescent cigarette smoking, particularly in the case of Hispanic adolescents.

This study used cross-sectional survey data to examine pathways of association, which limits the causal interpretation of results (see Yanovitzky, 2005). Future research should identify how unsupervised time with peers may contribute to different risk behaviors including substance use. Meriting attention is research that highlights protective moderators (e.g., perceived parental trust, parental monitoring, and parent-teen communication) that limit the impact of unsupervised time with peers on cigarette smoking. Studies should examine how varied factors contribute to adolescent smoking in more than one way. The present study has provided information about one set of pathways through which unsupervised time with peers contributes to adolescent cigarette smoking. Longitudinal studies that examine the effect of unsupervised time with peers on adolescent smoking are needed to fully disentangle the causal relationship. Longitudinal data that examine both direct and indirect relationships between unsupervised time with peers and adolescent smoking will permit the measurement of differences or change from one period to another and can be used to locate the causes of social phenomena such as adolescent cigarette smoking (see Menard, 1991).

### Funding

None declared.

### Declaration of Interests

None declared.

### References

- Ahern, C. H., Batchelor, S. M., Blanton, C. J., Law, M., Loo, C. M., Pevzner, E. S., et al. (2000). Youth tobacco surveillance—United States 1998–1999. *MMWR Morbidity and Mortality Weekly Report*, 49, 1–93.
- Akers, R. (1998). *Social learning and social structure: A general theory of crime and deviance*. Boston, MA: Northeastern University Press.
- Austin, E. W., & Knaus, C. S. (2000). Predicting the potential for risky behavior among those “too young” to drink, as the results of appealing advertising. *Journal of Health Communication*, 5, 13–27.
- Austin, E. W., Pinkleton, B. E., & Fujioka, Y. (2000). The role of interpretation processes and parental discussion in the media’s effects on adolescents’ use of alcohol. *Pediatrics*, 105, 343–349.
- Austin, E. W., Pinkleton, B. E., Hust, S. J. T., & Cohen, M. (2005). Evaluation of an American Legacy Foundation/Washington State Department of Health media literacy pilot study. *Health Communication*, 18, 75–95.
- Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2007). Adolescents’ time use: Effects on substance use, delinquency, and sexual activity. *Journal of Youth and Adolescence*, 36, 697–710.
- Bauer, E. L. (2006). *Is the influence of unsupervised time with peers on delinquency conditioned by the deviance of one’s peers?* Retrieved September 19, 2007, from <https://drum.umd.edu/dspace/bitstream/1903/3548/1/umi-umd-3382.pdf>
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Borawski, E. A., Ievers-Landis, C. E., Lovegreen, L. D., & Trapl, E. S. (2003). Parental monitoring, negotiated unsurprised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health*, 33, 60–70.
- Brook, J. S., Balka, E. B., Rosen, Z., Brook, D. W., & Adams, R. (2005). Tobacco use in adolescence: Longitudinal links to later problem behavior among African American and Puerto Rican urban young adults. *Journal of Genetic Psychology*, 166, 133–151.
- Castro, F. G., Barrera, M., Pantin, H., Martinez, C., Felix-Ortiz, M., Rios, R., et al. (2006). Substance abuse prevention research with Hispanic populations. *Drug and Alcohol Dependence*, 84S, S29–S42.
- Castro, F. G., Boyer, G. R., & Balcazar, H. G. (2000). Healthy adjustment in Mexican-American and other Hispanic adolescents. In R., Montemayor, G. R., Adams and T. P., Gullotta (Eds.), *Adolescent diversity in ethnic, economic, and cultural contexts* (pp. 141–178), Thousand Oaks, CA: Sage Publications.
- Centers for Disease Control and Prevention. (2000). Tobacco use among middle and high school students—United States 1999. *MMWR Morbidity and Mortality Weekly Report*, 49, 49–53.
- Cohen, D. A., Farley, T. A., Taylor, S. N., Martin, D. H., & Schuster, M. A. (2002). When and where do youths have sex: The potential role of adult supervision. *Pediatrics*, 110, 1–6.
- Colwell, B., Ramirez, N., Koehly, L., Stevens, S., & Smith, D. W. (2006). Seasonal variations in the initiation of smoking among adolescents. *Nicotine & Tobacco Research*, 8, 239–243.
- Colwell, M. J., Pettit, G. S., Meece, D., Bates, J. E., & Dodge, K. A. (2001). Cumulative risk and continuity in nonparental care from infancy to early adolescence. *Merrill-Palmer Quarterly*, 47, 207–234.
- Dishion, T. J., Spracklen, K. M., Andrews, D. W., & Patterson, G. R. (1996). Deviancy training in male adolescent friendships. *Behavior Therapy*, 27, 373–390.

- DuBois, D. L., & Silverthorn, N. (2004). Do deviant peer associations mediate the contributions of self-esteem to problem behavior during early adolescence? A 2-year longitudinal study. *Journal of Clinical Child and Adolescent Psychology, 33*, 382–388.
- Ebin, C. J., Sneed, C. D., Morisky, D. E., Rotheram-Borus, M. J., Magnusson, A. M., & Malotte, C. K. (2001). Acculturation and interrelationships between problem and health behaviors among Latino adolescents. *Journal of Adolescent Health, 28*, 62–72.
- Ellickson, P. E., Orlando, M., Tucker, J. S., & Klein, D. J. (2004). From adolescence to young adulthood: Racial/ethnic disparities in smoking. *American Journal of Public Health, 94*, 293–299.
- Ellickson, P. E., Tucker, J., & Klein, D. (2001). Patterns of tobacco use from adolescence to young adulthood. *Health Psychology, 20*, 186–195.
- Ennett, S., Bauman, K. E., Hussong, A., Faris, R., Foshee, V. A., DuRant, R., et al. (2006). The peer context of adolescent substance use: Findings from social network analysis. *Journal of Research on Adolescence, 28*, 159–186.
- Epstein, J. A., Griffin, K. W., & Botvin, G. J. (2000). A model of smoking among inner-city adolescents: The role of personal competence and perceived social benefits of smoking. *Preventive Medicine, 31*, 107–114.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191.
- Fraueglass, S., Routh, D. K., Pantin, H., & Mason, C. (1997). Family support decreases influence of deviant peers on Hispanic adolescents' substance use. *Journal of Clinical Child Psychology, 26*, 15–23.
- Greene, K., Krcmar, M., Walters, L. H., Rubin, D. L., & Hale, J. L. (2000). Targeting adolescent risk-taking behaviors: The contributions of egocentrism and sensation seeking. *Journal of Adolescence, 23*, 439–461.
- Haynie, D. L., & Osgood, D. W. (2005). Reconsidering peers and delinquency: How do peers matter? *Social Forces, 84*, 1109–1130.
- Horigian, V. E., Lage, O. G., & Szapocznik, J. (2006). Cultural differences in adolescent drug abuse. *Adolescent Medicine Clinics, 17*, 469–498.
- Knobloch, L. K., Solomon, D. H., & Cruz, M. G. (2001). The role of relationship development and attachment in the experience of romantic jealousy. *Personal Relationships, 8*, 205–224.
- Larson, R. W. (2000). Toward a psychology of positive youth development. *American Psychologist, 55*, 170–183.
- Larson, R. W., Hansen, D. M., & Moneta, G. (2006). Differing profiles of developmental experiences across types of organized youth activities. *Developmental Psychology, 42*, 849–863.
- Levitt, M. Z., Selman, R. L., & Richmond, J. B. (1991). The psychosocial foundations of early adolescents' high-risk behavior: Implications for research and practice. *Journal of Research on Adolescence, 4*, 349–378.
- Marsiglia, F. F., Kulis, S., Hecht, M. L., & Sills, S. (2004). Ethnicity and ethnic identity as predictors of drug norms and drug use among preadolescents in the US Southwest. *Substance Use and Misuse, 39*, 1061–1094.
- McVie, S., & Bradshaw, P. (2005). *Adolescent smoking, drinking and drug use*, Retrieved September 26, 2007, from [http://www.law.ed.ac.uk/cls/esytc/7Smoking\\_Drinking\\_Drug\\_Use.pdf](http://www.law.ed.ac.uk/cls/esytc/7Smoking_Drinking_Drug_Use.pdf).
- Menard, S. (1991). *Longitudinal research*. Newbury Park, CA: Sage Publications.
- Oetting, E. R., & Beauvais, F. (1986). Peer cluster theory: Drugs and the adolescent. *Journal of Counseling and Development, 65*, 17–22.
- Osgood, D. W., & Anderson, A. L. (2004). Unstructured socializing and rates of delinquency. *Criminology, 42*, 519–549.
- Osgood, D. W., Wilson, J. K., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1996). Routine activities and individual deviant behavior. *American Sociological Review, 61*, 635–655.
- Posner, J. K., & Vandell, D. L. (1999). After-school activities and the development of low-income urban children: A longitudinal study. *Developmental Psychology, 35*, 868–879.
- Simantov, E., Schoen, C., & Klein, J. D. (2000). Health-compromising behaviors: Why do adolescents smoke or drink? Identifying underlying risk and protective factors. *Archives of Pediatrics and Adolescent Medicine, 154*, 1025–1033.
- Smith, K., & Stutts, M. (1999). Factors that influence adolescents to smoke. *Journal of Consumer Affairs, 33*, 321–358.
- Strait, S. C. (1999). Drug use among Hispanic youth: Examining common and unique contributing factors. *Hispanic Journal of Behavioral Sciences, 21*, 89–103.
- Sussman, S., Dent, C. W., Severson, H., Burton, D., & Flay, B. R. (1998). Self-initiated quitting among adolescent smokers. *Preventive Medicine, 27*, A19–A28.
- Sutherland, E. H. (1947). *Principles of criminology* (4th ed.). Chicago, IL: J.B. Lippincott.
- Sutherland, E. H., & Cressey, D. R. (1978). *Criminology* (10th ed.). Philadelphia, PA: Lippincott.
- Tebes, J. K., Feinn, R., Vanderploeg, J. J., Chinman, M. J., Shepard, J., Brabham, T., et al. (2007). Impact of a positive youth development program in urban after-school settings on the prevention of adolescent substance use. *Journal of Adolescent Health, 41*, 239–247.
- Tickle, J. J., Hull, J. G., Sargent, J. D., Dalton, M. A., & Heather-ton, T. F. (2006). A structural equation model of social influences and exposure to media smoking on adolescent smoking. *Basic and Applied Social Psychology, 28*, 117–129.
- University of Michigan. (2000). *Cigarette use and smokeless tobacco use decline substantially among teens* [press release]. Ann Arbor, MI: Author.
- Vandivere, S., Tout, K., Zaslow, M., Calkins, J., & Capizzano, J. (2003). *Unsupervised time: Family and child factors associated*

## Unsupervised time with peers and smoking

*with self-care*, Retrieved September 19, 2007, from [http://www.urban.org/UploadedPDF/310894\\_OP71.pdf](http://www.urban.org/UploadedPDF/310894_OP71.pdf)

Vega, W. A., Sribney, W. M., & Achara-Abrahams, L. (2003). Public health matters. *American Journal of Public Health, 93*, 1057–1064.

Warr, M. (2005). Making delinquent friends: Adult supervision and children's affiliations. *Criminology, 4*, 77–105.

Yanovitzky, I. (2005). Sensation seeking and adolescent drug use: The mediating role of association with deviant peers and pro-drug discussions. *Health Communication, 17*, 67–89.