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EXAMINING ETHNIC DIFFERENCES IN PREDICTORS OF FEMALE ADOLESCENT SMOKING IN RURAL VIRGINIA

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Abstract

We examined the salience of multiple ecological factors (individual, family, peer, school, and community) as differential predictors of smoking for adolescent African-American and Whites in a sample of 2,029 7^{th}-12^{th} grade girls from a Mid-Atlantic southeastern state. Hierarchical regression analyses revealed that, significant predictors of smoking in the White female model included coping by taking drugs, grades, frequency of using alcohol, frequency of using marijuana, parent quality, and perceived availability of cigarettes. Significant predictors of smoking in the African-American female model included coping by taking drugs, attempted suicide, frequency of alcohol use, frequency of marijuana use, hours spent in club activities, hours spent in sports, and socioeconomic status. Implications for prevention and intervention programs are discussed.

Tobacco use is the single most preventable cause of death and disease in our society today (CDC, 1999). Each year, tobacco use causes more than 430,000 deaths and costs the Nation approximately $50–$73 billion in medical bills alone. It is the leading cause of lung cancer, pulmonary disease, heart disease, stroke, vascular disease, and peptic ulcer disease (Slade, 1993). In addition, tobacco use is highly addictive. Close to 70 percent of smokers want to quit smoking, but only 2.5 percent are able to quit and remain tobacco free each year (CDC, 1999).

Nearly all smokers begin as adolescents (U.S. Department of Health and Human Services, 1994). While not all adolescents who try cigarettes continue to smoke as adults, those who smoke only a few cigarettes during their teens are twice as likely to become adult smokers as those who do not (Chassin, Presson, Sherman, & Edwards, 1990). This smoking activity is only the beginning of a lifetime of health problems for tens of thousands of people because about 60 percent of current smokers began by the age of 14 (Gold, 1995).

Although overall rates of smoking among adolescents have declined (Johnston, O'Malley & Bachman, 2002), adolescent girls have become a major target of the tobacco industry's effort to keep smoking in the mainstream (Gold, 1995). Finally, according to a nationally representative cross-sectional study, girls are more susceptible to smoking behavior than boys evidenced by reports that although they have not smoked in the past, they might in the future (Kaufman et al., 2002). Studies of adult smokers suggest that women have more difficulty quitting than do men (Fiore, 1992; Gilchrist, Schinke & Nurius, 1989;) and that fewer women actually quit (U.S. Bureau of the Census, 1992).

Much research has been conducted on risk factors for drug use among African American adolescents. Generally, these studies point to the negative consequences of living in low resource communities with elevated rates of poverty, crime, violence, and related risk conditions

as contributors to drug use. Yet, in spite of many unfavorable community circumstances, African American adolescents consistently report the lowest rates of tobacco and other drug use compared to non-Latino White and Latino Americans. The National Household Survey of Drug Abuse shows that 23% of African American youth, ages 12-18 smoke as compared to 38% of Native American and 26% of White adolescents (SAMHSA.2001). Fewer studies have focused on the protective factors for tobacco use among African American female adolescents.

Both White and African American female adolescent smokers from rural communities are of particular interest for several reasons. Results from a four-year national longitudinal U.S. study of smoking with 68,270 youth demonstrate that the highest levels of smoking were found for rural adolescents and adolescents living in the south (Aloise-Young, Wayman & Edwards, 2002). In their nationally representative longitudinal *Monitoring the Future* study, Johnston et al. (2002) report that cigarette use declined in large and smaller cities but continued to increase in non-metropolitan areas (those that do not contain a town of at least 50,000). Findings from the 1999 *National Household Survey on Drug Abuse* also demonstrate that cigarette use among teens is higher in rural than in urban settings (Kopstein, 2001). Cronk and Sarvela (1997) report that rural youth had higher rates of heavy alcohol and cigarette use than did their urban counterparts. Harrell, Bangdiwala, Deng, Webb and Bradley (1998) report that youth in rural setting were more likely than youth in urban settings to start smoking after age 12. Another study reports that adolescents from rural areas are at greater risk than those from urban areas of becoming new smokers (Horn, Dino & Momani, 1999). Taken together, these studies warrant a special focus on factors related to female adolescent smoking in rural areas.

Literature Review

Predictors of Smoking Behavior

Behavior is influenced by a host of factors both internal and external to the individual. Ecological theory (Bronfenbrenner, 1979, 1986), developmental contextualism (Lerner, 1991,

1995), and risk and protective factor theory (Bogenschneider, 1996), all of which support the notion of an interactive effect between the individual and his or her multiple contexts, provide the theoretical rational for examining multiple influences on female adolescent smoking behaviors. For the purpose of this study, we focus our attention on a multitude of factors located in the individual, family, peer, school, and community contexts.

At the individual level, an positive relationship has been established between adolescent smoking and delinquency (Kandel et al. 1997; Luthar & D'Avanzo, 1999), depression (Griesler, Kandel, & Davis, 2002; Sarigiani, Ryan & Peterson, 1999; Wagner & Atkins, 2000), use of alcohol (Griffin, Botvin, Doyle, Diaz & Epstein, 1999; O'Byrne, Haddock, Poston, & Mid American Heart Institute, 2002; Tucker, Ellickson & Klein, 2003), and dieting behavior (Austin & Gormaker, 2001; National Center on Addiction and Substance Abuse, 2003; Simantov, Schoen, & Klein, 2000). An inverse relationship has been demonstrated between adolescent tobacco use and: grade point average (Griffin et al., 1999; O'Byrne et al., 2002; Ritchey et al. 2001), stress and coping style (Byrne et al., 1995; Horn et al., 1999; National Center on Addiction and Substance Abuse, 2003; Sarigiani et al., 1999; Simantov et al., 2000) and participation in extracurricular activities, including religious-related activities (Aaron et al., 1995; Amey et al., 1996; Escobedo et al., 1993; Kaufman et al., 2002; National Center on Addiction and Substance Abuse, 2002; Simantov et al., 2000; Simons-Morton et al., 1999). The research is mixed with respect to the relationship between smoking and self-esteem (Jackson, 1997; Lewis, Harrell, Bradley, & Deng, 2001; Moore, Laflin & Weis, 1996; Michell & Amos, 1997). Additionally, researchers have established that smoking behavior is more prevalent in White versus African-American adolescent girls (e.g. Gittlesohn, Roche, Alexander & Tassler, 2001; Kelder et al., 2003; Mermelstein & the Tobacco Control Network Writing Group, 1999).

At the family level, researchers have found that predictors of female adolescent smoking behavior include coming from a single-parent household, (Ritchey et al., 2001, Simantov et al.,

2000; Tucker et al., 2003), the perception of low parental monitoring (Griffin et al. 2000; Lucas & Lloyd, 1999), and low parent-adolescent communication or poor relationship with parents (National Center on Addiction and Substance Abuse, 2003).

At the peer level, susceptibility to peer pressure (Ritchey, et al., 2001; Sarason, Mankowski, Peterson & Dihn, 1992; Urberg, Cheng, & Shyu, 1991) has been linked with smoking behavior. Attachment to teachers and school is related to lower levels of smoking behavior (Lloyd, Lucas, & Fernbach, 1997; MacDonald & Wright, 2002) while skipping school is related to higher levels (Kaufman et al., 2002). Finally, availability of cigarettes is related to smoking behavior (Castrucci, Gerlach, Kaufman & Orleans, 2002; Emery, Gilpin, White & Pierce, 1999).

Research Questions

The purpose of this study is twofold. First, because most of the current studies do not differentiate between urban and rural youth, we will examine the salience of these predictors in a population of rural female adolescents. Second, we will examine whether or not these factors are equally predictive for both White and African-American females. Such information has important implications for prevention and intervention programs.

Method

Sample

Data were gathered from 2,029 7^{th}-12^{th} grade girls living in one of seven rural contiguous counties in Southeastern Virginia. Sixty-three percent reported their ethnic group as "White/Anglo/Caucasian," 28% as "Black or African-American," 3% as "mixed race/biracial," 2% as "Other," 1% as "Hispanic or Latino," 1% as "Asian," and 1% as Native American. Only White (n=1271) and African-American (n=566) students were retained for analyses. The mean age was 15.4 years. Based on a composite score of parent education and employment status,

approximately 27% of White female participants were classified as low SES, 60% as middle SES, and 13% as high SES. About 43% of African-American female participants were classified as low SES, 47% as middle SES, and 10% as high SES.

Procedure

This study is part of larger comprehensive survey of the attitudes, behaviors, values, worries and hopes of Virginia teens enrolled in the 7^{th}-12^{th} grades. It was constructed by a group of youth and adults in partnership with the university faculty as part of a community-based action research effort (see Huebner 2002, for details of this process). The resulting 174-item survey was administered during regular classes on one day to all students who were present, had parent permission and chose to participate. Teachers were trained to administer the survey, to answer questions about the survey and to collect the answer sheets in a manner that would respect the confidentiality of each student. Students were assured that their answers were anonymous and reminded not to put their names on the booklets or response sheets.

Measures

Unless otherwise noted, all measures were drawn from the Teen Assessment Project (Small & Rodgers, 1995) or the Youth Risk Behavior Survey (Center for Adolescent and School Health, 2000). Reliability of the Youth Risk Behavior Survey items has been established and is reported by Brener et al. (1995).

Smoking Frequency. One item asked participants "During the past 30 days, on how many days did you smoke cigarettes, cigars or use chewing tobacco products?" Responses ranged from (0) = 0 days, to (6) = all 30 days.

Individual Factors

Ethnicity. Participants self reported their ethnicity. Responses were coded such that (0) = White and (1) = minority.

Coping Mechanism. One question asked: "When you face difficulties or feel tense, how often do you smoke, drink or use drugs not prescribed by a doctor?" Responses ranged from (0) = never to (4) = most of the time.

Delinquency. This 9-item scale measured the frequency with which respondents reported participation in a variety of delinquency activities including: cheating on a test, skipping school, using fake identification, running away, driving a car without the owner's permission, purposely damaging property, stealing, breaking into a car or building, and getting into trouble with the police. Response options ranged from (0) = never to (3) = five or more times. Higher scores reflect higher participation in delinquent acts (White $\alpha = .78$; African American $\alpha = .77$).

Grades. Participants were asked to self-report on the average grades they usually received in their school courses. Responses ranged from (0) = mostly below D's to (7) = mostly A's. Higher scores reflect higher grades.

Self-esteem. Rosenberg's (1965) 10-item scale was used to examine participants' global self-esteem. Item responses ranged from (1) = strongly disagree to (4) = strongly agree. Items were recoded such that high scores indicate higher levels of self-esteem (White $\alpha = .88$; African American $\alpha = .81$).

Depression. One item asked, "During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?" Responses included (0) = no or (1) = yes.

Suicidal Ideation. One item asked, "During the past 12 months, did you make a plan about how you would attempt suicide?" Responses included (0) = no or (1) = yes.

Suicide Attempt. One item asked, "During the past 12 months, how many times did you actually attempt suicide?" Responses ranged from (0) = 0 times to (4) = 6 or more times.

Alcohol use. One item asked, "During the past 30 days, on how many days did you have at least one drink of alcohol?" Responses ranged from (0) = 0 days to (6) = all 30 days.

Marijuana use. One item asked, "During the past 30 days, on how many times did you smoke marijuana (dope, pot, weed)?" Responses ranged from (0) = 0 times to (5) = 40 or more times.

Involvement in conventional activities. Five items measured participants' involvement in conventional activities. Participants were asked how often on average they spent time in several different types of activities. These activities included school-based non-sport extracurricular activities, volunteering in the community, church or other religious-related activities, school or community-based sports, and non-school related clubs. Responses ranged from (0) = never, to (9) = daily. Responses were summed such that higher scores represent higher overall involvement. Internal consistency was not computed on these items since conceptually they were not expected to be interrelated. This measure yields a global picture of involvement in prosocial activities.

Dieting behavior. One item asked participants to describe their behavior related to weight. Responses were coded such that (0) = being satisfied with weight or trying to gain weight and (1) = trying to lose weight.

Family Factors

Socioeconomic status (SES). SES was computed using a composite score of parent education and employment status.

Family structure. One question asked participants "Whom do you live with most of the time?" Responses were coded such that (0) = living with non-intact nuclear family and (1) = living with biological mother and father.

Parental monitoring. The Parental Monitoring Scale consisted of eight items assessing participants' perception of how well their parents monitoring their whereabouts and friends.

Responses ranged from (0) = never to (4) = always (White α = .81; African American α = .79). Higher scores reflect higher levels of parental monitoring.

Parent quality. The Parental Quality Scale consisted of three items: "My parents are good parents," "My parents care about me" and "My parents respect me". Responses ranged from (0) = never to (4) = always (White α = .82; African American α = .79). Higher scores reflect higher perceived parental quality.

Parent-adolescent communication. The Parent-Adolescent Communication Scale consisted of seven items. Participants were asked to report how often during the past year they had communicated with their parents about a variety of topics ranging from drugs and alcohol to teachers or classes in school. Response categories ranged from (0) = never to (4) = very often (White α = .81; African American α = .80). Higher scores reflect greater frequency of communication.

Peer Factors

Peer pressure. Two items assessed participants' level of perceived pressure. These items asked participants to rate how often they let their friends talk them into doing things they did not want to do, and how often they were afraid to do things their friend would not approve of. Responses ranged from (0) = never to (4) = very often. These items were summed. Higher scores reflect higher levels of pressure.

School Factors

School attachment. Four items were used to assess school attachment. They were: "I enjoy going to school"; "Teachers in my school encourage me to do and be the best I can"; "Teachers in my school respect and listen to me"; and "I believe I am getting a good, high quality education at my school". Response options ranged from (0) = strongly disagree to (3) =

strongly agree. These items were combined into a scale by computing an average score (White α = .76; African American α = .73).

Community Factors

Perceived availability of cigarettes. One question asked: "How easy would it be fore you to get cigarettes, chewing tobacco, cigars, cigarillos." Responses ranged from (0) = very easy to (4) = very difficult.

Results

Means and standard deviations on all variables are presented by ethnicity in Table 1. As seen in this table, there were significant mean level differences between White and African-American females with respect to age (Whites slightly older), use of cigarettes (Whites higher), using drugs as a coping mechanism (Whites slightly higher), depression (Whites slightly higher), alcohol use (Whites slightly higher), participation in non-sport extracurricular activities (African-Americans slightly higher), volunteering (African-Americans slightly higher), participation in non-school clubs (Whites slightly higher), dieting behavior (Whites slightly higher), family structure (Whites more likely to have two parents), parent communication (Whites slightly higher), peer pressure (Whites slightly higher) and perceived availability of cigarettes (Whites perceive easier access).

Insert Table 1 about here

To examine the first two research questions regarding factors predicting rural female adolescent smoking behaviors as well as ethnic differences between White and African-American female adolescents, three hierarchical models were conducted. Specifically, we entered ecological variables in blocks starting with individual level factors, family, peer, school,

and community. The first model included all the females in the sample ((F=56.05, R^2=.51, df=24, 1308, p<001). The second model was conducted with White females (F=41.21, R^2=.53, df=24, 883, p<001) and the third model with African-American females (F=11.09, R^2=.48, df=24, 287, p<001).

As illustrated in Table 2, in the all female model, significant predictors of cigarette use included coping by taking drugs (Beta = .430 p=.000), grades (Beta = -.069, p =.002), depression (Beta=.046, p=.05), frequency of using alcohol (Beta=.103 p=.000), frequency of using marijuana (Beta=.190, p=.000), hours spent in non-sport community clubs (Beta=-.059 p=.006), parent quality (Beta=.045, p=.06), and perceived availability of cigarettes (Beta=-.082, p=.000).

As illustrated in Table 3, in the White female model, significant predictors included coping by taking drugs (Beta=.471, p=.000), grades (Beta=-.105, p=.000), frequency of using alcohol (Beta=.078, p=.012), frequency of using marijuana (Beta=.136, p=.000), parent quality (Beta=.069, p=.017), and perceived availability of cigarettes (Beta=-.076, p=.005). As illustrated in Table 4, in the African-American female model, significant predictors of cigarette smoking included coping by taking drugs (Beta=.221, p=.000), attempted suicide (Beta=.169, p=.001), frequency of alcohol use (Beta=.236, p=.000), frequency of marijuana use (Beta=.294, p=.000), hours spent in club activities (Beta=.090, p=.054), hours spent in sports (Beta=-.111, p=.021), and socioeconomic status (Beta=.116, p=.011).

Insert Table 2-4 about here

Discussion

Many of the factors found to predict female adolescent smoking in a rural sample were consistent with those cited previously in the literature. Specifically, our findings indicate that using drugs as a coping mechanism (e.g. Guthrie, Young, Boyd & Kinter, 2001; Sarigiani et al.

1999; Simantov et al. 2000), depression (e.g. Sarigiani et al. 1999), use of alcohol and marijuana (e.g. Griffin et al. 1999; Tucker et al. 2003) availability of cigarettes (Castrucci et al., 2002; Emery et al., 1999), grades in school (e.g. Griffin et al. 1999; O'Bryne et al. 2002; Ritchey et al. 2001), quality of parent-adolescent relationship (e.g. Simantov et al. 2000), and time spent in non-sport community clubs (e.g. Simantov et al. 2000) were predictive of smoking behavior in rural female adolescents.

With respect to ethnic differences, our findings revealed that several factors differentiated smoking behavior in White versus African-American adolescents. Grades, attachment to parents, and perceived ease of availability were unique predictors for White female adolescents. Suicide attempts, participation in community clubs, participation in sports, and socioeconomic status were the unique predictors for African-American females in our study. For both White and African-American rural females the only common individual level factors were alcohol and marijuana use and using drugs as a coping mechanism.

Several researchers have suggested that girls may use substances as a coping mechanism to deal with pressure to excel or to self-medicate (e.g. Luthar & D'Avanzo, 1999). Both these explanations could hold true for the present sample given that grades and depression were also related to smoking behavior. If rural adolescent girls are turning to smoking and other drug use to deal with pressure or with depression, our findings point to the need for examining the availability of mental health services in rural areas. School-based mental health services in urban areas have been shown to increase adolescents' access to mental health services—especially among minority and low-income groups (Juszczak, Melinkovich, & Kaplan, 2003). Given these findings, exploring options for expanding school-based mental health services to rural areas seems warranted.

Given that conventional out-of-school time activities have been associated with less tobacco use (Simantov et al. 2000), intervention/preventionists should examine the out-of-school

time options available to rural girls—especially those of African-American descent. Particular emphasis should be on providing more sporting and other extracurricular-based activities. Often in rural areas, out-of-school time activities are limited to those provided by the school. Transportation, budget constraints and the lack of a volunteer pool are all potential factors that contribute to fewer out-of-school time opportunities for rural youth. Additionally, providers of existing out-of-school time opportunities should be aware of differences in programming for adolescent boys and girls. For example, Huebner and Betts (2002) reported that relationships with youth development staff are particularly salient for girls—therefore staff should be as intentional about building relationships with girls as they are about the types of programs they offer.

It is interesting to note that we were unable to replicate some of the factors related to female adolescent smoking that have previously been reported in the literature including delinquency (Kandel et al. 1997; Luthar & D'Avanzo, 1999) dieting (Austin & Gormaker, 2001; National Center on Addiction and Substance Abuse, 2003; Simantov et al., 2000), self-esteem (Jackson, 1997; Lewis et al., 2001; Moore et al., 1996; Michell & Amos, 1997), parental monitoring (Griffin, Botvin, Scheier, Diaz & Miller, 2000; Lucas & Lloyd, 1999), parent-adolescent communication, peer pressure (Ritchey, et al. 2001; Sarason et al. 1992; Urberg et al., 1991) or school attachment (Lloyd et al., 1997; MacDonald & Wright, 2002). This failure to replicate could be due to contextual differences between urban and rural youth (e.g. less anonymity in rural areas) or to differences in specific measures. Future studies should employ longitudinal designs and include adolescent girls from both rural and urban settings so direct comparisons can be made.

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Table 1: Means and standard deviations of all variables

	White (n=1271)		African-American (n=566)		
	Mean	SD	Mean	SD	F
Age	3.51	1.48	3.09	1.65	7.34*
Use Cigarettes	1.12	2.08	.57	1.33	147.59**
Delinquency	.30	.38	.29	.38	.03
Grades	5.19	1.62	4.49	1.61	.09
Using Drugs to Cope	.87	1.29	.61	1.07	32.57**
Self-esteem	3.06	.63	3.19	.57	1.84
Depression	.36	.48	.29	.45	37.19**
Suicide Plan	.17	.37	.17	.38	.24
Suicide Attempt	.17	.55	.18	.57	.63
Alcohol Use	.83	1.20	.59	1.10	16.33**
Marijuana Use	.34	.92	.32	.85	1.14
Extra-curricular activities (non-sport)	2.36	2.52	2.85	2.81	47.27**
Volunteering	1.35	1.87	1.41	2.31	37.45**
Religious-related activities	1.81	1.89	2.59	2.28	17.22**
Sports	2.92	3.06	2.58	3.06	.05
Non-school clubs	1.00	1.81	.72	1.76	13.77**
Dieting behavior	.58	.49	.47	.50	8.66*
Family Structure	.60	.49	.36	.48	15.58**
SES	2.17	1.04	1.80	1.08	.54
Parental Monitoring	2.88	.68	2.78	.73	2.80
Parent Quality	3.43	.72	3.53	.68	3.39
Parent Communication	2.20	.87	2.16	.94	5.92*
Peer Pressure	1.70	1.46	1.34	1.66	6.42*
School Attachment	1.61	.63	1.63	.65	.51
Availability of Cigarettes	1.50	1.92	2.29	2.11	48.45**

Note: *p<.01. ** p<.001.

Table2: Hierarchical Regression by ecological model variables on Cigarette Use with all Females

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
1. Age	.024	.499	.499	81.88** (16, 1316)
Delinquency	.012			
Coping with Drugs	.447**			
Grades	-.069**			
Self-esteem	-.013			
Depression	.052			
Suicide plan	-.039			
Suicide attempt	.023			
Alcohol frequency	.110**			
Marijuana frequency	.194**			
Hours in activities	-.006			
Hours in clubs	.033			
Hours Volunteering	.012			
Hours in Religious Org.	-.029			
Hours Community Clubs	-.054			
Dieting	-.005			
2. Age	.021	.501	.003	1.32 (5, 1311)
Delinquency	.017			
Coping with Drugs	.448**			
Grades	-.066*			
Self-esteem	-.026			
Depression	.050			
Suicide plan	-.037			
Suicide attempt	.027			
Alcohol frequency	.111**			
Marijuana frequency	.187**			
Hours in activities	-.009			
Hours in clubs	.033			
Hours Volunteering	.012			
Hours in Religious Org.	-.027			
Hours Community Clubs	-.056*			
Dieting	-.003			
Structure	-.019			
Socioeconomic Status	.009			
Parental Monitoring	-.024			
Parental Quality	.045			
Parent Communication	.021			

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
3. Age	.018	.502	.001	1.78 (1, 1310)
Delinquency	.017			
Coping with Drugs	.449**			
Grades	-.064*			
Self-esteem	-.032			
Depression	.049			
Suicide plan	-.036			
Suicide attempt	.026			
Alcohol frequency	.111**			
Marijuana frequency	.186**			
Hours in activities	-.008			
Hours in clubs	.033			
Hours Volunteering	.011			
Hours in Religious Org.	-.026			
Hours Community Clubs	-.055*			
Dieting	-.001			
Structure	-.018			
Socioeconomic Status	.010			
Parental Monitoring	-.026			
Parental Quality	.045$^+$			
Parent Communication	.023			
Pressure	-.027			
4. Age	.018	.502	.000	.000 (1, 1309)
Delinquency	.017			
Coping with Drugs	.449**			
Grades	-.064*			
Self-esteem	-.032			
Depression	.049			
Suicide plan	-.036			
Suicide attempt	.026			
Alcohol frequency	.111**			
Marijuana frequency	.186**			
Hours in activities	-.008			
Hours in clubs	.033			
Hours Volunteering	.011			
Hours in Religious Org.	-.026			
Hours Community Clubs	-.055*			
Dieting	-.001			
Structure	-.018			
Socioeconomic Status	.010			
Parental Monitoring	-.026			
Parental Quality	.045$^+$			
Parent Communication	.023			
Pressure	-.027			

School Attachment	.000			
Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
5. Age	-.001	.507	.005	13.22** (1, 1308)
Delinquency	.016			
Coping with Drugs	.430**			
Grades	-.069*			
Self-esteem	-.033			
Depression	.046			
Suicide plan	-.034			
Suicide attempt	.023			
Alcohol frequency	.103**			
Marijuana frequency	.190**			
Hours in activities	-.003			
Hours in clubs	.033			
Hours Volunteering	.016			
Hours in Religious Org.	-.022			
Hours Community Clubs	-.059*			
Dieting	.002			
Structure	-.015			
Socioeconomic Status	.008			
Parental Monitoring	-.016			
Parental Quality	$.045^{+}$			
Parent Communication	.019			
Pressure	-.029			
School Attachment	.010			
Availability of Cigarettes	-.082**			

Note: Standardized Regression coefficients and overall F-test are significant at p<.001
**p<.001, *p<.005, $^{+}$p<.06

Table 3: Hierarchical Regression by ecological model variables on Cigarette Use by White Females

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
1. Age	.012	.515	.515	59.77** (16, 901)
Delinquency	.021			
Coping with Drugs	.486**			
Grades	-.117**			
Self-esteem	-.002			
Depression	.051			
Suicide plan	-.038			
Suicide attempt	.010			
Alcohol frequency	.085*			
Marijuana frequency	.145**			
Hours in activities	.003			
Hours in clubs	.017			
Hours Volunteering	.036			
Hours in Religious Org.	-.047			
Hours Community Clubs	-.045			
Dieting	-.019			
2. Age	.005	.521	.006	2.35* (5, 896)
Delinquency	.020			
Coping with Drugs	.488**			
Grades	-.107**			
Self-esteem	-.020			
Depression	.051			
Suicide plan	-.034			
Suicide attempt	.015			
Alcohol frequency	.085*			
Marijuana frequency	.131**			
Hours in activities	.004			
Hours in clubs	.021			
Hours Volunteering	.035			
Hours in Religious Org.	-.041			
Hours Community Clubs	-.043			
Dieting	-.017			
Structure	-.032			
Socioeconomic Status	-.014			
Parental Monitoring	-.053			
Parental Quality	.067*			
Parent Communication	.029			

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
3. Age	.003	.521	.000	.225 (1, 895)
Delinquency	.021			
Coping with Drugs	.487**			
Grades	-.106**			
Self-esteem	-.022			
Depression	.051			
Suicide plan	-.034			
Suicide attempt	.015			
Alcohol frequency	.085*			
Marijuana frequency	.131**			
Hours in activities	.005			
Hours in clubs	.021			
Hours Volunteering	.034			
Hours in Religious Org.	-.040			
Hours Community Clubs	-.043			
Dieting	-.017			
Structure	-.031			
Socioeconomic Status	-.014			
Parental Monitoring	-.054			
Parental Quality	.067*			
Parent Communication	.030			
Peer Pressure	-.011			
4. Age	.003	.521	.000	.135 (1, 894)
Delinquency	.019			
Coping with Drugs	.487**			
Grades	-.105**			
Self-esteem	-.021			
Depression	.051			
Suicide plan	-.033			
Suicide attempt	.015			
Alcohol frequency	.085*			
Marijuana frequency	.130**			
Hours in activities	.006			
Hours in clubs	.021			
Hours Volunteering	.035			
Hours in Religious Org.	-.040			
Hours Community Clubs	-.043			
Dieting	-.017			
Structure	-.032			
Socioeconomic Status	-.014			
Parental Monitoring	-.053			
Parental Quality	.069*			
Parent Communication	.030			

Peer Pressure	-.011
School Attachment	-.010

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
5. Age	-.014	.526	.004	7.82* (1, 893)
Delinquency	.014			
Coping with Drugs	.471**			
Grades	-.105**			
Self-esteem	-.017			
Depression	.051			
Suicide plan	-.031			
Suicide attempt	.014			
Alcohol frequency	.078*			
Marijuana frequency	.136**			
Hours in activities	.009			
Hours in clubs	.020			
Hours Volunteering	.040			
Hours in Religious Org.	-.041			
Hours Community Clubs	-.047			
Dieting	-.013			
Structure	-.028			
Socioeconomic Status	-.016			
Parental Monitoring	-.040			
Parental Quality	.069*			
Parent Communication	.025			
Peer Pressure	-.009			
School Attachment	-.004			
Availability of Cigarettes	-.076*			

Note: Standardized Regression coefficients and overall F-test are significant at p<.001
**p<.001, *p<.005

Table 4: Hierarchical Regression by Ecological Model Variables on Cigarette Use by African-American Females

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
1. Age	.044	.458	.458	15.57** (16, 295)
Delinquency	-.062			
Coping with Drugs	.211**			
Grades	-.061			
Self-esteem	-.005			
Depression	.043			
Suicide plan	-.083			
Suicide attempt	.158*			
Alcohol frequency	.254**			
Marijuana frequency	.285**			
Hours in activities	.024			
Hours in clubs	.117*			
Hours Volunteering	-.086*			
Hours in Religious Org.	.076			
Hours Community Clubs	-.108*			
Dieting	.034			
2. Age	.046	.474	.016	1.81 (5, 290)
Delinquency	-.061			
Coping with Drugs	.217**			
Grades	-.065			
Self-esteem	-.020			
Depression	.048			
Suicide plan	-.074			
Suicide attempt	.176*			
Alcohol frequency	.244**			
Marijuana frequency	.299**			
Hours in activities	.016			
Hours in clubs	.098*			
Hours Volunteering	-.076			
Hours in Religious Org.	.075			
Hours Community Clubs	-.110*			
Dieting	.029			
Structure	-.033			
Socioeconomic Status	.108*			
Parental Monitoring	.030			
Parental Quality	.052			
Parent Communication	-.081			

Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
3. Age	.036	.480	.005	2.88 (1, 289)
Delinquency	-.066			
Coping with Drugs	.227**			
Grades	-.068			
Self-esteem	-.042			
Depression	.040			
Suicide plan	-.060			
Suicide attempt	.169*			
Alcohol frequency	.238**			
Marijuana frequency	.298**			
Hours in activities	.020			
Hours in clubs	.086			
Hours Volunteering	-.074			
Hours in Religious Org.	.082			
Hours Community Clubs	-.111*			
Dieting	.035			
Structure	-.030			
Socioeconomic Status	.117*			
Parental Monitoring	.030			
Parental Quality	.054			
Parent Communication	-.073			
Peer Pressure	-.080			
4. Age	.036	.480	.000	.228 (1, 288)
Delinquency	-.069			
Coping with Drugs	.228**			
Grades	-.064			
Self-esteem	-.039			
Depression	.042			
Suicide plan	-.062			
Suicide attempt	.172*			
Alcohol frequency	.237**			
Marijuana frequency	.297**			
Hours in activities	.019			
Hours in clubs	.088*			
Hours Volunteering	-.072			
Hours in Religious Org.	.081			
Hours Community Clubs	-.109*			
Dieting	.036			
Structure	-.029			
Socioeconomic Status	.118*			
Parental Monitoring	.034			
Parental Quality	.055			
Parent Communication	-.072			
Peer Pressure	-.078			

School Attachment	-.023			
Variable	Beta	R^2	$R^2\Delta$	FΔ(df)
5. Age	.026	.481	.001	.610 (1, 287)
Delinquency	-.068			
Coping with Drugs	.221**			
Grades	-.072			
Self-esteem	-.043			
Depression	.037			
Suicide plan	-.060			
Suicide attempt	.169*			
Alcohol frequency	.236**			
Marijuana frequency	.294**			
Hours in activities	.022			
Hours in clubs	.090*			
Hours Volunteering	-.074			
Hours in Religious Org.	.084			
Hours Community Clubs	-.111*			
Dieting	.038			
Structure	-.029			
Socioeconomic Status	.116*			
Parental Monitoring	.037			
Parental Quality	.055			
Parent Communication	-.070			
Peer Pressure	-.083			
School Attachment	-.014			
Availability of Cigarettes	-.039			

Note: Standardized Regression coefficients and overall F-test are significant at p<.001
**p<.001, *p<.005