impacTEEN

A Policy Research Partnership to Reduce Youth Substance Use

Parental Influences, Public Policy, and Youth Smoking Behavior

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Abstract

Objectives. The purpose of this paper is to jointly examine the importance of parental influences, prices, and tobacco control policies on the smoking behavior of youths.

Methods. Data are drawn from the Audits & Surveys (A&S) 1996 survey of high school students across the United States from "The Study of Smoking and Tobacco Use Among Young People" to examine the impact of parental influences on the probability of youth smoking in the context of both specific observable parenting behaviors and in terms of youths' perceptions of the importance of their parents' opinions.

Results. The key finding is that parental influences play a significant role in youth smoking decisions. Our results by age reveal that specific modifications related to improving communication channels and implementing home smoking rules and more general changes that improve the quality of the parent-child relationship such that teens place a higher value on their parents' opinions are likely to be particularly effective in the early teen years. Parental influences are found to play a relatively stronger role in the smoking behavior of female and white youths when we estimate our models separately by gender and race.

Conclusions. A comprehensive approach beyond the standard tobacco control policies is the best way to effectively reduce youth smoking. The results from this study show that controlling for prices and youth access measures, it is also important that policymakers solicit the help of parents in the fight against youth smoking. Campaigns to inform/educate parents about their potential impact on the smoking behavior of their children and the encouragement of parents to modify their behavior should be made part of a national strategy to reduce youth smoking.

1. Introduction

Given the clear and established evidence on the detrimental health outcomes that arise due to cigarette smoking, the development of effective public policies to reduce youth smoking is of paramount importance to public health officials (USDHHS 1994 and 2000). In an effort to thwart youth cigarette use, policymakers have an extensive range of specific policy instruments that can be drawn upon such as cigarette excise taxes, youth access restrictions, clean indoor air laws, advertising restrictions, and campaign ads directed at youths and parents.

Recently, campaign ads have been implemented that solicit the influence of parents in the aim to reduce substance use among America's youths. For example, the National Youth Anti-Drug Media Campaign for a Drug-Free America encourages parents to know what their kids are doing and provides an extensive "How-To Guide" brochure for parents and caregivers to help keep their children drug free. Within the Philip Morris Youth Smoking Prevention Program, television and print campaigns have been designed to reach parents with the message that they should stay involved in their kids' lives and talk to their children about not smoking. This program also provides an online "Parent Resource Center" that includes information for parents on the importance of parental influences in preventing children from smoking highlighting elements such as setting rules, staying involved and talking with your kids, and tips for parents who smoke.

Numerous econometric studies on the determinants of youth smoking behavior have sought to provide evidence on the potential effectiveness of changes in tax policy and tobacco control policies as a means to reduce the prevalence and intensity of youth smoking. Indeed, much of this work has been the backbone for formulating anti-smoking policies (See Chaloupka and Warner (2000), as well as the Surgeon General's Reports USDHHS (1994 and 2000)).

In general, the single most consistent conclusion from the economic literature on the demand for cigarettes is that consumers react to price changes according to general economic principles – an increase in cigarette prices leads to a decrease in the propensity of smoking and the intensity with which smoker's smoke. That is, the economic research has shown that cigarette prices are inversely related to cigarette demand. A National Cancer Institute sponsored gathering of economists and other experts concluded that the overall price elasticity of adult cigarette demand falls in a narrow range of -0.3 to –0.5 (National Cancer Institute, 1993).

A smaller literature on youth and young adult responsiveness to cigarette prices has also emerged. The general consensus from these studies is that youth and young adults are at least as responsive to price as adults are, if not significantly more price responsive (USDHHS, 1994 and 2000, Chaloupka and Warner, 2000). The majority of estimates of the price elasticity of demand for cigarettes for youths range from –0.5 to –1.5 (Lewit, Coate and Grossman, 1981; Chaloupka and Grossman 1996; Chaloupka and Pacula, 1998; Evans and Huang, 1998; Tauras and Chaloupka, 1999; Harris and Chan, 1999; Gruber, 2001; Ross and Chaloupka, 2002). These results suggest that, on average, a 10% increase in the price of cigarettes would decrease overall youth consumption of cigarettes by approximately 10%. However, it should be noted that a few studies have found no significant relationship between prices and young adult and youth smoking behavior (Chaloupka, 1991; Wasserman et al., 1991).

A limited body of research has examined the impact of tobacco control policies on youth smoking. Recent evidence suggests that policies related to youth access, in particular, strong restrictions are likely to play an important role in youth smoking behavior (Chaloupka and Grossman, 1996; Chaloupka and Wechsler, 1997; Chaloupka and Pacula, 1998; Tauras and Chaloupka,1999).

A broader body of social science and medical literature has provided empirical evidence on the importance of a variety of different aspects of parental influences on youth smoking behavior. Many studies have shown that strong parent-family connectedness/bonding/communication reduces the likelihood of smoking among youth (Bailey, Ennet and Ringwalt,1993; Cohen, Richardson, and LaBree, 1994; Biglan et al., 1995; Krohn et al., 1989, Distefan et al., 1998, Kafka, 1991). Parental monitoring and limit setting has also been shown to be an important factor associated with youth cigarette use (Jackson, 1997; Biglan et al., 1995; Cohen, Richardson and LaBree, 1994; Ary et al., 1999; Simmons-Morton et al., 1999; Pierce et al., 2002).

The empirical evidence related to the impact of smoking rules in the home on youth smoking behavior is mixed. While Henriksen and Jackson (1998) and Wakefield et al. (2000) find that more restrictive home smoking rules and households that do not permit smoking in the home decrease the risk of youth cigarette use, several studies by Jackson and colleagues have found no association between household smoking rules and youth cigarette use (Jackson, Bee-Gates and Henriksen, 1994; Jackson, 1997; Jackson and Henrikson, 1997; Jackson et al., 1997).

The potential impact of parental smoking on youth smoking behavior has been examined extensively. The majority of studies reveal that parental role modeling is a key factor in the smoking behavior of youths. The most consistent finding is that adolescents are significantly more likely to smoke if their parents smoke (Bauman et al., 1984; Bauman et al., 1990; Bauman et al. 1995; Iannotti and Bush, 1992; Melby et al., 1993; Cohen, Richardson and LaBree, 1994; Flay et al., 1994; Moreno et al., 1994; Jackson, Bee-Gates and Henrikson, 1994; Ary et al. 1995; Biglan et al., 1995; Hu et al., 1995; Oygard et al., 1995; Jackson, 1997; Jackson and Henriksen, 1997; Farkas, 1999) However, a limited number of studies have found no relationship between parent and youth smoking (Bauman et al., 1984; Ary and Biglan, 1988; Bailey Ennet and Ringwalt, 1993; Distefan et al., 1998)

In comparison to the economic and broader health-related research cited above, this is the first study to examine the combined association of an extensive range of parental influences, prices, and tobacco control policies with the smoking status of youths. In this regard, this paper expands the standard economic model of consumer demand theory to account for parental influences in the estimation of the demand for cigarettes by youths. Our analyses examine both specific observable parenting behaviors and youths' perceptions of the importance of their parents' opinions. Our first model accounts for practical observable parenting measures of bonding (extent of discussions about daily issues between parent/adult and child), limit setting with regard to free time, home smoking rules, and parental smoking behavior. Studying specific parental behaviors is especially useful since it offers evidence on particular modes of parenting that may be modified in order to reduce youth smoking. Second, we examine the importance of parenting behavior as reflected by the extent to which the child thinks that his or her parents' opinions are important in their decision to smoke. This latter model captures the combined importance of the observable parenting influences such as those included in our first model plus a host of unobservable parenting influences that contribute to the potential impact that parents may have on the likelihood that their children smoke. Overall, the results from our empirical models will have strong policy implications related to the importance of parental influences, cigarette tax policy, and other tobacco control policies.

The paper is structured as follows. Section 2 discusses the data used in this study. Next, in our methods section 3, we describe our estimation model. Our results are presented in section 4. Finally, section 5 concludes the paper.

2. Data

To undertake our analyses, we draw on the Audits & Surveys (A&S) 1996 survey data of high school students across the United States from "The Study of Smoking and Tobacco Use Among Young People" as our primary data set. In the A&S survey, a total of 17,287 high school students, from 202 public, private, and parochial high schools, were interviewed between March and July 1996. The high school survey is a nationally representative random sample. All questionnaires were self-administered and respondents were assured of anonymity and confidentiality of their responses. In addition to the teen survey, there also exists a short school administrator survey component providing information on school rules related to smoking. Our estimation sample contains 11,237 observations based on a sub-sample of high school students for which we have non-missing data. Table 1 provides the summary statistics for our full sample and by smoking status. Below, we describe the variables used in this study in terms of the dependent variable of interest, the parental measures, control variables, and the external price and tobacco control policy data that we have merged with the A&S data.

Dependent Variable: Our measure of youth smoking participation among high school students is constructed as a 0-1 dichotomous indicator of smoking participation based on the answer to the question: "Think about the last 30 days. On about how many of those days, if any, did you smoke?". Based on an answer to this question that indicated smoking any amount on one or more days in the last 30 days, the student qualified as a current smoker.

Parental Measures: The A&S survey collected data that allow us to assess the importance of parental influences that stem from measures of parent/child bonding, rule/limit setting, and parent smoking behavior. These observable variables include: how often the student talks with the parents/adults in their home about what they have done during the day (less than once a week, once a week, a few times a week, almost every day); the existence of rules on spending free time; rules about

smoking in the household (allowed anywhere, allowed in limited areas, special guests only, no one is allowed to smoke in the house); and, whether or not either parent (actual, step, or adoptive) smoke. We also draw on an alternative measure that reflects the importance of parenting behavior as internalized by the extent to which the child thinks that his or her parents' opinion are important in their decision to smoke. Specifically, this measure is based on the question: "How important to you are your parents' opinions about smoking when it comes to your decision about whether or not to smoke?" (very important, somewhat important, not too important, not at all important). This latter measure can be thought of as a proxy for observable parenting measures such as those described above, and other unobservable parenting influences.

Control variables: The A&S survey collected a variety of demographic and socioeconomic data. Several potential determinants of youth cigarette smoking have been constructed from these data. Our control variables include: the age of the respondent; his/her gender; race and ethnicity (African American, Hispanic, Asian, White, other [includes also American Indians]); family structure (live alone, live with parents, live with others not including parents); parental education (completed college); completeness of the family (parents are married, separated, divorced, both deceased, father deceased, mother deceased); frequency of participation in religious services (frequent participation, infrequent participation, no participation); and, urbanization status (living in a city, in a suburb, in a village/town). And, from the School Administrator survey, we control for what restrictions the school has on cigarette smoking (ban on smoking).

External Price and Policy Variables: In addition to the data collected by the A&S survey, a number of other variables from external data sources are utilized in our analyses. These variables include cigarette prices and tobacco control policies.

Price Measure: We have merged the state level average price (in cents) for a pack of cigarettes recorded from the Tax Burden on Tobacco as published by the Tobacco Institute. It is computed as the weighted average of a single pack, carton, and vending machine cigarette prices, including state excise taxes. Prices of both branded and generic cigarettes are used in the average.

Tobacco Control Policies: We have merged in a refined tobacco youth access index based on the measure developed by Alciati, et al. for the National Cancer Institute, as modified by Gruber and Zinman. This index captures the extensiveness and comprehensiveness of state policies aimed at reducing youth access to tobacco products. Twelve separate restrictions comprise the youth access index variable including minimum age of purchase, packaging, clerk intervention, photo identification, vending machine availability, free distribution of samples, graduated penalties, random inspections, statewide enforcement, advertising, licensing, and restrictions on minors. Each of these restrictions takes on a value of between either 0-4 or 0-5 depending on the strength of the regulation. Summing up the ratings for each of the twelve restrictions and subtracting two points in the various components of the index if states preempt stronger local actions derives the youth access index.

3. Methods

This paper evaluates the importance of parental influences on the smoking behavior of youths. Our goal is to expand the standard empirical economic model of the determinants of youth smoking to simultaneously incorporate the importance of cigarette prices, tobacco control policies, and parental influences. Traditional empirical behavioral models for examining the determinants of cigarette smoking are based on the economic theory of demand. In the derivation of the cigarette demand equation, it is assumed that an individual's utility is a function of the consumption of cigarettes and other goods, and tastes. An individual is assumed to maximize utility subject to a budget constraint that is comprised of the price of cigarettes, the prices of other goods, and income. Based on this utility

maximization process, the cigarette demand equation is hypothesized to be a function of the price of cigarettes, prices of other goods, income, and variables that govern individual tastes (typically reflected by demographic variables). It should be noted here that the price of cigarettes is assumed to incorporate the "full price" of consumption. The "full price" includes both the direct monetary costs (prices inclusive of excise taxes) and indirect costs associated with obtaining and consuming cigarettes (for example, policies related to possession such as minimum legal purchase age restrictions and prohibitions on sale).

While traditional economic models of smoking behavior emphasize price, the broader social science literature suggests a wide range of factors that underlay theories related to youth behavioral outcomes. (See Petraitis, Flay, and Miller (1995) for an extensive review of such theories). In particular, cultural, social situational, and personal/biological factors have been related to youth substance behaviors. Within their "theory of triadic influences", Flay and Petraitis (1994) and Flay, Petraitis and Hu (1995) demonstrate the paths by which these three factors relate to youth behavior. Within the "social situational" stream, the authors outline the potential link between youth substance use and social/normative influences that stem from parenting styles, the bond between parents and youths, and parental substance use behavior.

Applied to our economic framework, the theory of triadic influences clearly suggests the inclusion of covariates within a utility maximization model that account for potential parental influences on the preferences of youths in their decision to smoke. Hence, in our empirical analyses, we incorporate our parental measures into the standard economic model of demand that includes the effects of cigarette prices, tobacco control policies, school-based restrictions on smoking and demographic variables on the probability of smoking among high school students. We assess the

impact of parental influences on youth smoking behavior in the context of both specific observable parenting behaviors and in terms of youths' perceptions of the importance of their parents' opinions.

First, we specify a model that accounts for direct observable measures of parenting practices related to communication/bonding, limit/rule setting, household rules about smoking, and parental smoking behavior. Model 1 specifies the probability of smoking by youth i, S_i (a 0-1 dichotomous indicator for smoking participation), as:

$$S_i = \beta_0 + \beta_1 P_i + \beta_2 X_i + \beta_3 R_s + \beta_4 C_i + \varepsilon_{is} \qquad (1)$$

where P_i is a vector of parental measures, X_i is a vector of personal and family characteristics, R_s reflects school rules on smoking at school s, and C_i is a vector containing cigarette prices and tobacco control policies. Specifically, our vector of observable parental measures, P_i , accounts for communication/bonding (extent of discussions about daily issues between parent/adult and child), limit setting with regard to free time, home smoking rules, and parental smoking behavior.

In our second model, instead of focussing on direct observable parenting practices, we examine the importance of parenting behavior as reflected by the extent to which the child thinks that his or her parents' opinions are important when making their decision to smoke. Hence, Model 2 specifies the probability of smoking by youth i, S_i (a 0-1 dichotomous indicator for smoking participation), as:

$$S_i = \beta_0 + \beta_1 O_i + \beta_2 X_i + \beta_3 R_s + \beta_4 C_i + \varepsilon_{is} \qquad (1)$$

where O_i measures how important the child's parents' opinions about smoking are when it comes to their decision about whether or not to smoke, and as defined above, X_i is a vector of personal and family characteristics, R_s reflects school rules on smoking at school s, and C_i is a vector containing cigarette prices and tobacco control policies. In Model 2, O_i can be thought of as capturing the contribution of our vector of observable parental variables (P_i) included in Model 1 plus the importance of many unobservable measures of parenting quality.

4. Results

Tables 2 and 3 present the results from Model 1 for our full sample and by gender, race and age. Table 4 presents the results based on Model 2 for our full sample and all sub-samples. Focusing first on the results based on Model 1 for our full sample, we see that our parental variables related to communication/bonding, limits on free time, rules about smoking in the home, and parental smoking all have a significant effect on youth smoking behavior.

Our results reveal that communication between parents and teens is of key importance. The extent to which parents or another adult in the household engages in discussions with youths about what they have done during the day significantly reduces the likelihood that they smoke. The increasing frequency of such discussions defined by once a week, a few times a week, or almost every day compared to less than once a week, significantly reduces the probability of youth smoking participation at an increasing rate of 3%, 4%, and 7%, respectively. Teens that live in households where limits are set on how they spend their free time are 3% significantly less likely to smoke.

Alternative sets of household smoking rules suggest that a full ban on smoking in the household is the best strategy to reduce the likelihood of youth smoking. Teens that live in homes where no one is allowed to smoke are approximately 5% less likely to smoke compared to their youth counterparts that live in homes where anyone is allowed to smoke. Finally, parental smoking significantly increases the likelihood that their child will smoke. Youths that live in households where either or both parents (natural, adoptive, or step) smoke are 6% more likely to smoke.

The results from Tables 2 and 3 reveal differential effects of parental influences on youth smoking behavior by gender, race, and age. In terms of gender differences, parental influences clearly have a stronger impact on girls. Daily discussion between parents/adults and kids significantly reduces smoking for girls and boys by 8% and 5%, respectively. Rules related to smoking in the home or

spending free time do not significantly affect the smoking behavior of boys, while banning smoking in the house and setting rules on free time significantly reduces the likelihood of smoking among girls by 6% and 4%, respectively. Parental smoking significantly increases the likelihood of smoking for both genders with a stronger impact on girls.

Regressions run separately by race for whites, African Americans and Hispanics also reveal several differences. While the results from our full sample show that African Americans and Hispanics are less likely to smoke compared to their white counterparts, our observed parental influence variables are found to have the strongest potential impact for white youths with the exception of home smoking rules which have no significant impact among this group. Parental smoking and household smoking rules are found to be important determinants of youth smoking behavior in African American families, while discussion with parents and smoking rules impact on Hispanic youths.

From Table 3, we see that it is important for parents to engage in frequent communication patterns with their teens early. Daily discussions between parents/adults and youths significantly reduce the likelihood of smoking among 13-14 years by 12% with the magnitude of this effect dropping off quickly as the teenager ages. Similarly, a ban on smoking in the household has the strongest impact on reducing smoking among 13-14 years old (about 11%) with no effect by the time youths reach the age of 17. Rules on spending free time were found to be significant only for 16 year olds. Finally, parental smoking behavior did not significantly affect the youngest cohort (aged 13-14) and had roughly an equal impact of increasing the likelihood of smoking across the remaining age groups by about 6-7%.

Our results from Model 2 which measure how important the child's parents' opinions are when it comes to their decision about whether or not to smoke, confirm the importance of the impact of parental influences on youth smoking behavior. Youths who consider their parents' opinions to be very

important are 18% less likely to smoke compared to their counterparts who do not value their parents' opinions. This effect was found to be substantially stronger for girls than boys, leading to a 22% versus 14% decrease in the probability of smoking, respectively. While similar results were found for white and hispanic youths, the probability of smoking among black youths who reported that their parents' opinions were very important was reduced by only 8%. Finally, the results by age strongly reflect the importance of positive parenting practices in the early teen years. Youths aged 13-14 and 15 who reported that their parents' opinions were very important to them in their decision to smoke were 29% and 23%, respectively, less likely to smoke. The impact is still strong for older teens though it quickly levels off to a reduction in the prevalence of smoking by about 15-17%. The extent to which youths value their parents' opinions is likely to be affected by the observed parental measures examined in Model 1 plus a host of other unobserved parental influences. Our results suggest that any positive change in parental practices that improves the quality of the parent-child relationship will clearly help to reduce smoking among their children.

Turning to the results of the impact of cigarette prices on youth smoking, focusing on Model 1 for our full sample, the results yield a price elasticity of youth smoking participation estimate of –0.26 which is at the low end compared to the estimates found in the existing literature. Undertaking sensitivity analyses, re-estimating our model without accounting for parental influences results in a higher price elasticity estimate of –0.33. Hence, the price elasticity estimates based on estimation models that do not account for parental influences tend to capture both direct and indirect price effects on youth smoking behavior. The results by gender and race reveal that price effects are strongest and significant for male and white youths.

Stronger public policies related to limiting youth access to cigarettes significantly reduce the likelihood of smoking among teens. Our results show that while the youth access measure is significant

across genders, it has a stronger effect on boys. By age, the results show that the youth access measure does not affect our youngest (aged 13-14) group who probably do not buy their own cigarettes nor the oldest group of 18-19 year olds who are legally able to buy cigarettes in nearly all states. The impact of restricting youth access to cigarettes increases in importance over the range between 15 to 17 years of age. While our school policy variable of a ban on smoking reduces the likelihood of youth smoking, it is insignificant for our full sample and weakly significant for boys and older teens.

We now turn to the impact of the remainder of our control variables on youth smoking participation focussing our discussion on the results from Model 1 for our full sample. From the first column of Table 2, the results of the students' personal characteristics show that older students are significantly more likely to smoke but that there are no significant gender differences in smoking participation. Consistent with the youth smoking literature, significant differences are found by race. African American, Hispanic, Asian, and our other race category of youths are significantly less likely to smoke compared to their white counterparts by approximately 20%, 8%, 12%, and 5% respectively. Students who attend religious services at least weekly are about 6% less likely to smoke, while students who live alone are 16% more likely to smoke.

With respect to the socio-demographic parental control variables, we find that having a mother or father who have completed college does not significantly affect the likelihood of youth smoking participation. The marital status, however, of the students' parents is found to play a significant role in the smoking status of the youths. Student's with parents who are divorced, separated, or never married, respectively, are 6%, 5%, and 4% significantly more likely to smoke compared to their counterparts with married parents. The importance of the parents' marital status is likely related, in part, to the fact that the time constraints faced by single parents may affect the quality of the relationship between the parent and child.

5. Conclusions

This paper has offered new evidence on the determinants of youth smoking behavior by jointly examining the importance of parental influences, cigarette prices, and tobacco control policies. The key finding is that parental influences play a significant role in youth smoking decisions. Our results also show that higher cigarette prices and stronger restrictions related to youth access significantly reduces the likelihood of smoking. We report a price elasticity of youth smoking participation of –0.26.

This study highlights practical aspects of parenting such as bonding/communication, home smoking rules, rules on spending free time, and parental smoking behavior that are associated with adolescent cigarette use which could potentially be modified to reduce the prevalence of youth smoking. Our results by age reveal that specific modifications related to improving communication channels and implementing home smoking rules should occur as early as possible as the greatest positive impact of these parental interventions were seen for younger teens. Further, we find that any positive changes that improve the quality of the parent-child relationship such that teens place a higher value on their parents' opinions are likely to be particularly effective in the early teen years. Overall, we also show that parental influences play a relatively stronger role in the smoking behavior of female and white youths when we estimate our models separately by gender and race.

In line with an extensive body of existing literature highlighted in the introduction, our results confirm that parental role modeling is a key factor in the smoking behavior of youths. However, it is important to note that controlling for parental smoking in our model, we find all of our other observable parenting measure to be significant. This suggests that even if parents quit smoking, positive parenting practices will continue to contribute to the prevention of youth smoking.

Hence, our results provide evidence that cigarette excise taxes and public policies aimed at limiting youth access to cigarettes are effective policy instruments for reducing youth smoking. However, our results also highlight the fact that a comprehensive approach beyond the standard tobacco control policies is the best way to effectively reduce youth smoking. That is, we are able to show that controlling for prices and youth access measures, it is also important that policymakers solicit the help of parents in the fight against youth smoking. The empirical findings from this paper suggest that policymakers should implement campaigns to inform/educate parents about their potential impact on the smoking behavior of their children and encourage them to modify their behavior as part of a national strategy to reduce youth smoking. Further, better quality parental influences are likely to result in positive spillover effects in the form of lower levels of other risky youth behaviors.

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Table 1: Summary Statistics

Variables:	**Full Sample**	**Smokers**	**Non-Smokers**
Smoked in the last 30 days	0.2769	-	-
Discussion with Parents on Daily Issues:			
Less than weekly	0.1567	0.1755	0.1495
Once a week	0.0786	0.0836	0.0767
A few times a week	0.2553	0.2620	0.2528
Almost everyday	0.5094	0.4789	0.5210
Home smoking rules:			
Allowed anywhere	0.2392	0.3070	0.2133
Allowed in limited areas	0.1742	0.1790	0.1724
Special guests only	0.1066	0.1022	0.1083
No one is allowed smoking	0.4877	0.4192	0.5139
Rules on teens' spending free time	0.6795	0.6239	0.7008
Parent smokes	0.3763	0.4629	0.3431
Important of parents' opinions on smoking			
Very important	0.4622	0.2559	0.5412
Somewhat important	0.2954	0.3722	0.2659
Not too important	0.1377	0.2289	0.1028
Not at all important	0.1047	0.1430	0.0901
Cigarette Price	188.2985	187.0706	188.7686
	(21.948)	(23.150)	(21.454)
Youth Access Measure	14.0027	13.3329	14.2591
	(5.885)	(5.884)	(5.865)
School ban on smoking	0.9576	0.9550	0.9586
Age	16.2447	16.3832	16.1917
	(1.218)	(1.207)	(1.218)
Male	0.4574	0.4757	0.4504
Race:			
White	0.5271	0.6532	0.4788
Black	0.1723	0.0868	0.2050
Hispanic	0.2113	0.1829	0.2221
Asian	0.0373	0.0238	0.0425
Other race	0.0521	0.0534	0.0516
Living Arrangement:			
Living with parents	0.9666	0.9560	0.9568
Not living with parents	0.0398	0.0383	0.0404
Living alone	0.0036	0.0058	0.0028
Frequency of Religious Service Attendances:			
None	0.1533	0.1848	0.1413
Few Times A Year	0.4426	0.4982	0.4214
More Than Once A Week	0.4040	0.3169	0.4374
Parents' Education Level:			
Father complete college	0.3427	0.3443	0.3421
Mother complete college	0.3202	0.3166	0.3216
Parents' Marital Status:			
Married	0.6433	0.6043	0.6583
Never married	0.0570	0.0453	0.0614
Separated	0.0581	0.0598	0.0575
Divorced	0.2005	0.2517	0.1809
Parents deceased	0.0019	0.0019	0.0018
Father deceased	0.0287	0.0264	0.0297
Mother deceased	0.0105	0.0106	0.0105
Household Location:			
Living in a village	0.2478	0.2729	0.2382
Living in the city	0.5150	0.4690	0.5326
Living in the suburbs	0.2372	0.2581	0.2291
Sample Size	11,237	3,111	8,126

Note: Standard deviations are shown in brackets for non-dummy variables.

Table 2: Marginal Effects for Youth Smoking Participation
Full Sample, By Gender and By Race

Variables:	Full Sample (N=11,237)	By Gender		By Race		
		Girls (N=6,089)	Boys (N=5,140)	White (N=5,923)	Black (N=1,927)	Hispanic (N=2,374)
Discuss with parents: weekly	-0.0311* (0.0174)	-0.0392 (0.0242)	-0.0172 (0.0254)	-0.0293 (0.0288)	-0.0548* (0.0247)	-0.0347 (0.0318)
Discuss with parents: a few times a week	-0.0424*** (0.0130)	-0.0334* (0.0189)	-0.0536*** (0.0182)	-0.0759*** (0.0216)	-0.0021 (0.0216)	-0.0226 (0.0246)
Discuss with parents: almost everyday	-0.0707*** (0.0126)	-0.0824*** (0.0183)	-0.0538*** (0.0177)	-0.1072*** (0.0213)	-0.0233 (0.0193)	-0.0892*** (0.0232)
Home smoking rules: limited areas	-0.0238* (0.0126)	-0.0326** (0.0162)	-0.0081 (0.0201)	0.0012 (0.0197)	-0.0598*** (0.0173)	-0.0180 (0.0269)
Home smoking rules: special guests	-0.0211 (0.0157)	-0.0385* (0.0206)	0.0062 (0.0245)	0.0360 (0.0253)	-0.0110 (0.0254)	-0.0682** (0.0298)
Home smoking rules: no one allowed	-0.0461*** (0.0125)	-0.0639*** (0.0168)	-0.0218 (0.0185)	-0.0142 (0.0188)	-0.0700*** (0.0211)	-0.0619** (0.0265)
Rules on teens' spending free time	-0.0320*** (0.0095)	-0.0410*** (0.0137)	-0.0203 (0.0135)	-0.0389*** (0.0141)	-0.0139 (0.0173)	-0.0066 (0.0194)
Parent smokes	0.0623*** (0.0109)	0.0700*** (0.0149)	0.0543*** (0.0162)	0.0789*** (0.0167)	0.0451** (0.0198)	0.0250 (0.0211)
Cigarette Price	-0.0004* (0.0002)	-0.0001 (0.0027)	-0.0008** (0.0003)	-0.0007*** (0.0003)	0.0001 (0.0004)	-0.0002 (0.0008)
Youth Access Measure	-0.0041*** (0.0008)	-0.0031*** (0.0011)	-0.0051*** (0.0012)	-0.0043*** (0.0012)	-0.0038*** (0.0014)	-0.0051*** (0.0020)
School-ban on smoking	-0.0302 (0.0224)	-0.0106 (0.0305)	-0.0562* (0.0332)	-0.0556 (0.0378)	-0.0189 (0.0321)	-0.0275 (0.0474)
Age	0.0260*** (0.0036)	0.0112** (0.0048)	0.0439*** (0.0053)	0.0410*** (0.0054)	0.0006 (0.0063)	0.0170** (0.0072)
Male	-0.0045 (0.0088)	-	-	-0.0441*** (0.0128)	0.0400** (0.0168)	0.0367** (0.0188)
Black	-0.2014*** (0.0093)	-0.2267*** (0.0114)	-0.1678*** (0.0156)	-	-	-
Hispanic	-0.0794*** (0.0109)	-0.1107*** (0.0138)	-0.0354** (0.0173)	-	-	-
Asian	-0.1185*** (0.0180)	-0.1262*** (0.0232)	-0.1017*** (0.0285)	-	-	-
Other race	-0.0487*** (0.0175)	-0.0716*** (0.0223)	-0.0218 (0.0274)	-	-	-
Not living with parents	0.0087 (0.0230)	0.0435 (0.0317)	-0.0423 (0.0331)	0.0152 (0.0444)	0.0222 (0.0322)	0.0164 (0.0426)
Living alone	0.1615** (0.0794)	0.0297 (0.1040)	0.2417** (0.1123)	0.0566 (0.1814)	0.2077* (0.1338)	-0.0814 (0.1356)
Religious services: few annual attendance	0.0095 (0.0123)	0.0030 (0.0173)	0.0085 (0.0175)	0.0495*** (0.0175)	-0.0270 (0.0237)	-0.0759*** (0.0275)
Religious services: more than weekly	-0.0595*** (0.0127)	-0.0645*** (0.0176)	-0.0595*** (0.0185)	-0.0634*** (0.0184)	-0.0416* (0.0249)	-0.1165*** (0.0275)
Father complete college	0.0131 (0.0106)	0.0149 (0.0146)	0.0090 (0.0156)	0.0109 (0.0149)	-0.0080 (0.0196)	0.0358 (0.0268)
Mother complete college	0.0137 (0.0108)	0.0220 (0.0148)	0.0043 (0.0160)	0.0225 (0.0152)	0.0255 (0.0203)	-0.0161 (0.0266)
Parents never married	0.0362* (0.0219)	0.0674** (0.0293)	0.0062 (0.0338)	0.0062 (0.0510)	0.0330 (0.0235)	0.0035 (0.0391)
Parents separated	0.0492** (0.0200)	0.0934*** (0.0284)	0.0108 (0.0287)	0.0455 (0.0352)	0.0343 (0.0284)	0.0426 (0.0355)
Parents divorced	0.0616*** (0.0114)	0.0801*** (0.0154)	0.0440*** (0.0171)	0.0803*** (0.0157)	0.0057 (0.0232)	0.0356 (0.0249)
Parents deceased	0.0329 (0.1110)	-	0.1700 (0.1596)	0.4537* (0.2101)	-	0.1476 (0.2011)
Father deceased	0.0278 (0.0275)	0.0514 (0.0373)	-0.0058 (0.0404)	0.0046 (0.0482)	0.0064 (0.0346)	0.0419 (0.0562)
Mother deceased	0.0347 (0.0447)	0.0705 (0.0585)	-0.0127 (0.0695)	0.1976** (0.0809)	-0.0095 (0.0595)	-0.1048 (0.0574)
Living in the city	-0.0029 (0.0108)	0.0031 (0.0143)	-0.0095 (0.0164)	0.0098 (0.0153)	-0.0052 (0.0231)	-0.0503** (0.0257)
Living in the suburbs	0.0084 (0.0121)	0.0137 (0.0170)	0.0047 (0.0174)	0.0026 (0.0158)	0.0085 (0.0293)	-0.0074 (0.0333)

Note: Standard errors are shown in brackets.

Table 3: Marginal Effects for Youth Smoking Participation
Full Sample and By Age

Variables:	Full Sample (N = 11,237)	Age 13-14 (N = 724)	Age 15 (N = 2,613)	Age 16 (N = 3,208)	Age 17 (N = 2,764)	Age 18-19 (N = 1,919)
Discuss with parents: weekly	-0.0311* (0.0174)	-0.1039* (0.0472)	-0.0716** (0.0294)	-0.0016 (0.0336)	-0.0753** (0.0352)	0.0651 (0.0493)
Discuss with parents: a few times a week	-0.0424*** (0.0130)	-0.0673 (0.0435)	-0.0787*** (0.0234)	-0.0513** (0.0246)	-0.0453 (0.0276)	0.0322 (0.0349)
Discuss with parents: almost everyday	-0.0707*** (0.0126)	-0.1248*** (0.0445)	-0.1147*** (0.0244)	-0.0670*** (0.0240)	-0.0531** (0.0267)	-0.0294 (0.0322)
Home smoking rules: limited areas	-0.0238* (0.0126)	-0.0889** (0.0392)	-0.0177 (0.0239)	-0.0095 (0.0242)	0.0005 (0.0270)	-0.0539 (0.0328)
Home smoking rules: special guests	-0.0211 (0.0157)	-0.0778 (0.0478)	-0.0008 (0.0304)	-0.0528* (0.0284)	-0.0081 (0.0343)	-0.0015 (0.0420)
Home smoking rules: no one allowed	-0.0461*** (0.0125)	-0.1092** (0.0450)	-0.0746*** (0.0243)	-0.0411* (0.0236)	-0.0064 (0.0263)	-0.0501 (0.0311)
Rules on teens' spending free time	-0.0320*** (0.0095)	-0.0351 (0.0359)	-0.0288 (0.0200)	-0.0408** (0.0184)	-0.0225 (0.0192)	-0.0310 (0.0233)
Parent smokes	0.0623*** (0.0109)	0.0209 (0.0406)	0.0623*** (0.0216)	0.0615*** (0.0206)	0.0730*** (0.0231)	0.0598** (0.0273)
Cigarette Price	-0.0004* (0.0002)	-0.0002 (0.0007)	-0.0002 (0.0004)	-0.0008** (0.0004)	0.0004 (0.0005)	-0.0007 (0.0006)
Youth Access Measure	-0.0041*** (0.0008)	0.0021 (0.0028)	-0.0037** (0.0015)	-0.0052*** (0.0015)	-0.0074*** (0.0017)	-0.0024 (0.0021)
School-ban on smoking	-0.0302 (0.0224)	0.0486 (0.0689)	-0.0448 (0.0461)	-0.0414 (0.0459)	0.0296 (0.0426)	-0.1004* (0.0549)
Age	0.0260*** (0.0036)	-	-	-	-	-
Male	-0.0045 (0.0088)	-0.1020*** (0.0311)	-0.0509*** (0.0170)	-0.0006 (0.0164)	0.0341* (0.0181)	0.0336 (0.0227)
Black	-0.2014*** (0.0093)	-0.1497*** (0.0348)	-0.1548*** (0.0185)	-0.2055*** (0.0174)	-0.2232*** (0.0192)	-0.2488*** (0.0235)
Hispanic	-0.0794*** (0.0109)	-0.0514 (0.0399)	-0.0488** (0.0226)	-0.0834*** (0.0205)	-0.1058*** (0.0215)	-0.0745** (0.0282)
Asian	-0.1185*** (0.0180)	-0.1277** (0.0473)	-0.1509*** (0.0279)	-0.1020** (0.0358)	-0.0826* (0.0424)	-0.1363** (0.0481)
Other race	-0.0487*** (0.0175)	-0.0252 (0.0685)	-0.0481 (0.0323)	-0.0224 (0.0371)	-0.0801** (0.0333)	-0.0637 (0.0466)
Not living with parents	0.0087 (0.0230)	0.1358 (0.1167)	0.0713 (0.0637)	-0.0035 (0.0488)	-0.0164 (0.0431)	-0.0084 (0.0465)
Living alone	0.1615** (0.0794)	0.2841 (0.3950)	0.5582** (0.2202)	-0.0779 (0.1929)	0.1664 (0.1676)	0.1316 (0.1182)
Religious services: few annual attendance	0.0095 (0.0123)	-0.0210 (0.0483)	0.0526** (0.0269)	0.0116 (0.0231)	0.0003 (0.0251)	-0.0029 (0.0288)
Religious services: more than weekly	-0.0595*** (0.0127)	-0.0643 (0.0490)	0.0064 (0.0275)	-0.0481** (0.0241)	-0.0822*** (0.0259)	-0.1232*** (0.0299)
Father complete college	0.0131 (0.0106)	0.0304 (0.0413)	0.0082 (0.0205)	0.0006 (0.0196)	-0.0001 (0.0222)	0.0476* (0.0285)
Mother complete college	0.0137 (0.0108)	0.0018 (0.0394)	0.0382* (0.0210)	-0.0025 (0.0198)	0.0210 (0.0232)	0.0263 (0.0289)
Parents never married	0.0362* (0.0219)	0.1036 (0.0794)	-0.0190 (0.0396)	0.0134 (0.0412)	0.0654 (0.0465)	0.0525 (0.0561)
Parents separated	0.0492** (0.0200)	0.0876 (0.787)	0.0644* (0.0409)	0.0499 (0.0387)	0.0411 (0.0414)	0.0457 (0.0479)
Parents divorced	0.0616*** (0.0114)	0.0566 (0.0456)	0.0615*** (0.0226)	0.0464** (0.0207)	0.0744*** (0.0238)	0.0571** (0.0297)
Parents deceased	0.0329 (0.1110)	-	-	0.1622 (0.2244)	-	0.0629 (0.2129)
Father deceased	0.0278 (0.0275)	-0.0651 (0.0866)	0.0932 (0.0641)	0.0199 (0.0536)	0.1116* (0.0626)	-0.0763 (0.0523)
Mother deceased	0.0347 (0.0447)	-0.0028 (0.1458)	0.0490 (0.0825)	-0.0554 (0.0784)	0.1219 (0.1019)	0.0469 (0.1163)
Living in the city	-0.0029 (0.0108)	-0.0150 (0.0416)	-0.0040 (0.0213)	0.0018 (0.0202)	-0.0049 (0.0222)	-0.0029 (0.0278)
Living in the suburbs	0.0084 (0.0121)	0.0390 (0.0476)	-0.0186 (0.0232)	0.0138 (0.0230)	0.0100 (0.0248)	0.0352 (0.0320)

Note: Standard errors are shown in brackets.

Table 4 Marginal Effects of Students' Perception of Parental Opinions in Their Decision to Smoke (Full Sample, By Gender, Race and Age)

Variables:	Full Sample (N=11,237)	By Gender		By Race			By Age				
		Boys (N=5,140)	Girls (N=6,089)	White (N=5,923)	Black (N=1,927)	Hispanic (N=2, 374)	13-14 (N=724)	15 (N=2,613)	16 (N=3,208)	17 (N=2,764)	18-19 (N=1,919)
Not Too Important	0.0790*** (0.0176)	0.0910*** (0.0263)	0.0656*** (0.0235)	0.1144*** (0.0237)	0.0198 (0.0383)	0.0356 (0.0411)	-0.0776 (0.0466)	0.0420 (0.0353)	0.1086*** (0.0343)	0.1479*** (0.0368)	0.0533 (0.0423)
Somewhat Important	-0.0062 (0.0142)	-0.0020 (0.0213)	-0.0131 (0.0189)	-0.0103 (0.0200)	0.0455 (0.0331)	-0.0350 (0.0327)	-0.0703 (0.0469)	-0.0783*** (0.0266)	0.0045 (0.0272)	0.0628** (0.0300)	0.0074 (0.0354)
Very Important	-0.1844*** (0.0134)	-0.1448*** (0.0201)	-0.2188*** (0.0179)	-0.2155*** (0.0182)	-0.0800*** (0.0303)	-0.1949*** (0.0340)	-0.2913*** (0.0478)	-0.2263*** (0.0281)	-0.1523*** (0.0259)	-0.1774*** (0.0272)	-0.1582*** (0.0333)

Notes: (1) Standard errors are shown in brackets.
(2) The excluded category for the importance of parental opinion variable is "not at all important".
(3) Controls for age, gender, race, living arrangements, religious services, parents education, parents marital status, location of home, and the price, youth and access and school policy variables were included in the estimation but are not shown in the table.

Recent ImpacTeen and YES! Research Papers

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