Published in final edited form as:

Am J Addict. 2009 ; 18(5): 367–374. doi:10.3109/10550490903077788.

Youth Tobacco Access and Possession Policy Interventions: Effects on Observed and Perceived Tobacco Use

Leonard A. Jason,
DePaul University

Steven B. Pokorny,
University of Florida

Monica Adams,
DePaul University

Annie Topliff,
DePaul University

Courtney Harris, and
DePaul University

Yvonne Hunt
Cancer Prevention Fellowship Program, National Cancer Institute

Abstract

This study evaluated the effects of tobacco Purchase, Use and Possession (PUP) laws on student perceptions of adolescent tobacco use within towns and schools. Twenty-four towns were randomly assigned into two conditions, the experimental condition (E PUP) involved efforts to increase both PUP law enforcement and reduce minors' access to commercial sources of tobacco, whereas the control condition (C) focused only on efforts to reduce minors' access to commercial sources of tobacco. A Hierarchical Linear Modeling analytical approach was selected due to the multilevel data and nested design. The present study found that over time, youth in the experimental PUP condition observed less youth tobacco usage at school and in their town, and perceived lower rates of tobacco among their peers at school and among friends than youth in the control condition.

The findings suggest that PUP law enforcement might be used to strengthen community norms against youth tobacco use.

Keywords

Drug use; sales of drugs; PUP laws; minors' access to tobacco

Population-based approaches for smoking cessation attempt to reduce or eliminate tobacco use by changing the environment in which an individual smokes. Examples of population-based interventions include restricting where smoking is allowed (e.g., workplace bans), increasing the cost of cigarettes (e.g., taxation), and changing community norms (e.g., education, mass-media campaigns). Population-based approaches to cessation have a particular instrumental value, given their capacity to impact large numbers of smokers

relative to person-centered treatments. For example, comprehensive tobacco control efforts in flagship states such as California, Massachusetts, and Oregon have produced marked declines in adult smoking prevalence coupled with increased cessation activity (Wakefield & Chaloupka, 2000). The success of tobacco control with adults suggests that similar approaches would be useful for addressing smoking uptake and smoking persistence among youth; however, the evidence base supporting youth tobacco control is comparatively underdeveloped (Jason, Biglan, & Katz, 1998).

Several studies have found that tobacco Possession-Use-Purchase Laws (PUP) may help to reduce youth tobacco use (Jason, Pokorny, et al., 2007; Langer & Warheit, 2000; Lazovich et al., 2001). These laws provide youth consequences such as a police ticket for either possessing, using or purchasing tobacco products. Livingood et al. (2001) compared teen smoking attitudes and behaviors between two Florida counties with the highest level of PUP law enforcement and two counties with the lowest levels of enforcement. They found that youth in the high enforcement condition had a significantly reduced likelihood of 30-day tobacco smoking. Giovino et al. (2001) found that a higher state-level PUP index score (i.e., sum of the number of youth possession, use, and purchase laws in each state) was associated with lower likelihood of smoking in the past month and lower smoking intensity.

Other studies have found that local tobacco possession ordinances are associated with lower odds of youth smoking and higher odds of anti-smoking attitudes (Tworek, 2004), and that the threat of driver's license suspension is significantly associated with lower likelihood of future smoking intentions among committed smokers (Gottlieb et al., 2004). In an eight-town randomized study, white youth who lived in communities with strict enforcement of tobacco sales and possession laws had significantly fewer increases in the prevalence of tobacco use over time than those living in communities with only moderate enforcement of tobacco sales laws (Jason, Pokorny, & Schoeny, 2003). Unfortunately, small sample sizes, non-randomized designs, and other methodological problems weaken conclusions that can be made about these reviewed studies (Wakefield & Giovino, 2003).

Several social scientists suggest that tobacco sales and PUP law enforcement policies detract from other effective strategies to reduce youth tobacco use (Ling, Landman, & Glantz, 2002). In addition, they argue that there is not adequate evidence that these policies work (Wakefield, & Giovino, 2003). There is also a fear that this approach puts youth needlessly in contact with the criminal justice system. These types of coalitions also believe that by shifting enforcement efforts to teenagers, merchants who sell tobacco are protected from being fined.

Rather than focusing just on fining youth for possession of tobacco, some have argued for a combined approach involving consequences for both merchants who illegally sell tobacco and youth who illegally possess tobacco (Jason, Pokorny, & Schoeny, 2003). The PUP citations can also be handled as civil fines, just as one might receive a parking ticket, and in that way, the youth's actions would not place them into the criminal justice system. There is a need to determine whether these policies might influence rates of smoking among youth, in addition to creating other second order effects. For example, a PUP violation could result in the youth entering a cessation program. Milton et al. (2003) found that one state that passed PUP laws created a demand for youth cessation interventions. There is some evidence that these combined youth access and PUP interventions might also encourage communities to work on other tobacco control policies (Jason, Hunt, Adams, Pokorny, & Gadiraju, 2007). The exploration of these types of second order effects, such as the observation of youth using tobacco and perceptions of use among peers and friends would be important outcomes to assess in future studies.

Recently, a large randomized study of PUP law enforcement was completed by Jason et al. (2008). Twenty-four towns were randomly assigned into two conditions, the Experimental PUP (E PUP) condition involved both fining minors for possession of tobacco (PUP law enforcement) and reducing commercial sources of access to tobacco, and the Control (C) condition only involved efforts to reduce commercial sources of access to tobacco. Junior high and high school students in the 24 towns were surveyed. Findings indicated that rates of current smoking increased at a significantly slower rate for adolescents in towns where PUP laws were enforced. If PUP law enforcement resulted in lower youth tobacco use based on self-report data, then it would be of importance to confirm these effects by examining student observations and perceptions of adolescent tobacco use in towns and schools. The present study used the data set described in Jason et al.'s (2008) randomized study of 24 towns to investigate whether the enforcement of PUP laws affected observed and perceived tobacco use. It was hypothesized that students within towns exposed to an intervention designed to strengthen enforcement of PUP laws would report observing fewer students using tobacco in their schools and towns, and would perceive lower rates of peer tobacco use at school and among friends compared to towns that did not actively increase their PUP enforcement efforts.

Method

Participant Towns

The Youth Tobacco Access Project involved 24 towns in Illinois, with four cohorts of data collected from these towns in the spring of 2002, 2003, 2004, and 2005 (see Jason et al., 2008 for more details about town selection). In 2001, the 24 participating towns were matched for population size and median income and then randomly assigned to the two conditions. As stated previously, the C condition involved efforts at reducing youth access to commercial sources of tobacco, and the E PUP condition involved efforts at both reducing youth access to commercial sources of tobacco and increasing fines for minors, who possessed or used tobacco. At baseline, the C and E PUP towns did not differ significantly on population size, median household income, or rates of illegal tobacco sales to minors.

Procedure

Merchants in Illinois are prohibited from selling tobacco products to minors under the age of 18. In Illinois, many communities have local tobacco sales laws, which permit local enforcement activities to deter youth access to commercial sources of tobacco. Stores that sell cigarettes are required to post signs, indicating the law against selling cigarettes to minors. All 24 towns participated in a state sponsored tobacco sales enforcement program or worked with the research team to conduct a merchant education program and three annual checks of merchants for compliance with local tobacco sales laws. Merchants were fined for illegally selling tobacco products to minors, and sometimes faced license suspension. At baseline, all towns started out with rates of illegal tobacco sales of less than 20%, and overall rates between the E and C conditions did not differ over the course of the intervention. In other words, all towns were participating in the supply side of tobacco control activities, with regular merchant enforcements to reduce illegal sales of tobacco.

The twelve E communities agreed to initiate or increase PUP law enforcement practices, whereas the 12 C communities received instructions to maintain their current low levels of PUP law enforcement. Public tobacco usage among youth was reduced through active enforcement of local PUP laws. Police officers were trained, and instructed to issue citations to minors (e.g. a \$75 civic fine) who were caught using and/or possessing tobacco in public locations. These locations often included shopping areas, schools, and parks. There were no significant differences at baseline between the E and C conditions regarding PUP law

citations. Over a four year period, the average yearly number of PUP law citations issued to minors within the E communities was significantly higher than those within the C communities ($t(22) = -2.30, p = .03$; E Mean = 16.54, C Mean = 6.31).

Student Participants

The student survey was administered to students in grades 7 to 10 during 2002, grades 7 to 11 in 2003, and grades 7 to 12 in 2004 and 2005 (see Jason et al. 2008 for more details about survey administration). Across the four waves of data collection for the present study, a total of 52,550 students were eligible to be surveyed (i.e., enrolled in a target grade at a participating school) at one or more waves. In 11 of the 41 participating schools, school administrators selected only students who lived in the target towns to be eligible for surveys. Of the eligible students, parental consent forms were obtained for 33,991 (65%) students. A total of 29,851 (57%) of eligible students completed the survey during at least one wave of data collection. Over the course of four waves, a total of 59,160 surveys were completed, representing an average of two waves of data for each participating student. Of the 59,160 surveys, 482 (0.8%) were excluded from the analyses because of inconsistent or invalid responding across survey items. Because the analyses included a town-level covariate, 7,953 (13%) surveys (i.e., from 4,630 students) were excluded from analyses because the students lived outside of the participating towns and, therefore, were not directly exposed to the intervention. The final sample for the present analyses included 25,404 students and 50,725 assessments.

Measures

Student Survey—The Youth Tobacco Access Project's Student Survey is a 74 item self-report survey developed to assess students' demographic variables (i.e., gender, race, grade), as well as their attitudes and behaviors toward tobacco and other drugs (Altman et al., 1999; Jason et al., 2003; Rigotti et al., 1997). Students were also asked whether they have ever tried a variety of tobacco products, including cigarettes, chewing tobacco, smokeless tobacco, cigars, pipe tobacco, clove cigarettes, and bidis. Students were asked a series of additional questions, such as their age when they first used a tobacco product, where they obtain their tobacco (e.g., stores, vending machines, parents, siblings, friends, etc.), and how often they purchase tobacco products. Respondents were asked about their observation of tobacco use on school grounds and in their town, as well as perceptions of tobacco use among their school peers and friends.

Level-1 Variables—All Level-1 variables were derived from self-report data obtained from the student survey. Only variables expected to change from wave to wave were selected as level-1 time-varying covariates (i.e., friends who use tobacco). The levels of the variables in the HLM are not part of the psychometrics of the instrument, but the manner in which the variables were organized for analyses

Outcome variables: For the purposes of the current analyses, we evaluated how often students observed tobacco use at their school and within their town by the following two questions: "During the past 7 days, on how many days did you see minors using tobacco in your town?" (from 0 to 7 days), and "During the past 7 days, on how many days did you see minors using tobacco on your school's grounds?" (from 0 to 7 days). We also assessed the students' perception of tobacco usage among their peers at school and among their friends with the following two questions: "How many students at your school use tobacco?" (i.e., none of them, a few of them, some of them, most of them, all of them), and "How many of your friends (the people you hang out with) use tobacco products?" (i.e., none of them, a few of them, some of them, most of them, all of them).

Time: Time was modeled as a Level-1 variable and represents the wave of assessment.

Tobacco use by closest friends: The presence of closest friend tobacco users in the student's life was calculated as a continuous variable based on the response to the question: "How many of your four closest friends use tobacco? (None, 1, 2, 3, and 4)."

Level-2 Variables—All Level-2 variables represent stable student-level characteristics and were also derived from self-report data obtained from the student survey.

Grade: Grade was determined from the grade the student was in at the start of the study in 2002. Grade was grand mean centered.

Race: Race was determined from responses to the questions "Are you Latino or Hispanic origin?" (Yes or No) and "How do you describe yourself? Mark all that apply: Asian, Black/African American, Middle Eastern, Native American/Alaskan Native, Native Hawaiian/Other Pacific Islander, White/Caucasian, Other. Because the majority of students were White, African American, or Latino, this variable was reduced to four categories (i.e., White, African American, Latino, and Other). For the present analyses, this variable was indicator (i.e., dummy) coded by creating dichotomous variables, indicating African American, Latino, and Other. Therefore, in all analyses, White youth are the reference group for each of the three dummy coded variables.

Gender: Gender was coded as a dichotomous variable determined from responses to the question: "What is your gender? (Female or Male)." Females were coded as 0 and males as 1.

Adult tobacco users: The presence of an adult tobacco user in the home was calculated as a dichotomous variable determined by the response to the question: "Is there an adult (someone over 18 years old) living in your home who uses tobacco? (Yes or No)." No was scored as 0 and yes as 1.

Level-3 Variables—The Level-3 variables represent community-level constructs.

PUP Experimental versus Control condition: The 12 towns randomly assigned to receive support to increase PUP law citations were in the E PUP condition (with a score of 1), whereas the 12 towns randomly assigned to receive no support and consequently having lower levels of PUP law citations were in the C condition (with a score of 0).

Proportion of Commercial Tobacco Sales to Youth: Assessments of the proportion of commercial tobacco sales to youth occurred in year 2 and in year 4. A standardized procedure using female adolescents aged 15 or 16 to make cigarette purchases was used to estimate commercial tobacco availability to youth (see Jason et al., 2008). The average of the two assessments carried out by our research team represents the proportion of commercial tobacco sales to youth variable used in the final analyses.

Household Income: The median Household Income in thousands of dollars for each town was coded as a continuous variable based on the 2000 Census data. This variable was grand mean centered ($M = \$59,726$; $SD = \$20,785$) to represent the mean household income across the towns.

Statistical Analysis

A random coefficient multilevel analysis was performed using HLM 6.03 (Raudenbush, Bryk, & Congdon, 2006). This analytical approach was selected due to the multilevel data (i.e., observations within individuals within towns). Because outcomes were skewed, we selected a poisson distributed model, with constant exposure. Our interpretation focused on the population-average model as it tests for an intervention effect averaging across towns.

Because closest friends who use tobacco might change over time, we placed friends as a level-1, time-varying covariate. At Levels-2 and -3, the intercept was allowed to randomly vary, accounting for random variability in the outcome measures across individuals and towns. The wave slope was also modeled as random at Level-2, based on our prediction that individuals would vary in the likelihood that they would smoke over time. At Level-2 (i.e., person-level), we included grade, race, gender, and adult tobacco users as covariates. At Level-3 (i.e., town-level), we included experimental condition, town household income, and commercial availability of tobacco to minors. For each of the dependent variables, we first explored the results of an unconditional model to assess if there was significant between-town variation. In the next step, all student-level (i.e., Level-2) and the town-level (i.e., Level-3) variables were added to the model.

Results

The E PUP and C towns did not differ significantly at baseline on population size, median household income, commercial illegal sales of tobacco to minors, gender, race, grade level, the presence of adult smokers in the home, or friends who use tobacco. For each of the dependent variables, results from an unconditional model revealed significant between-town variation ($p < .01$).

Observed Tobacco by Minors within Towns

A number of individual factors significantly increased the likelihood of observing use of tobacco in a town at baseline: a greater number of friends who used tobacco ($OR = 1.21$; 95% CI 1.20 – 1.22), students who were in higher grade levels ($OR = 1.26$; 95% CI 1.24 – 1.27), an adult tobacco user in the home ($OR = 1.47$; 95% CI 1.43 – 1.51), and a student who was female ($OR = .97$; 95% CI .94 – .99). Compared to European Americans, less observed use of tobacco was reported by students who described themselves as Others ($OR = .82$; 95% CI .78 – .85).

Controlling for a variety of individual-level variables (described below), the odds that students observed minors using tobacco within their town at the start of the study was 1.82; 95% CI 1.62 – 2.06, an effect that did not vary by treatment condition. The E PUP treatment condition, in comparison to the C condition at the town level, was significantly associated with lower likelihood of students observing use of tobacco in the town ($OR = .98$; 95% CI .96 – .99). This meant that the slopes for the E PUP and C condition were significantly different over waves one through four (See Figure 1).

Observed Tobacco Use on School Grounds

A number of individual factors significantly increased the likelihood of observing tobacco use on school grounds at baseline: a greater number of friends who used tobacco ($OR = 1.24$; 95% CI 1.23 – 1.25), students who belonged to higher grade levels ($OR = 1.59$; 95% CI 1.58 – 1.61), an adult tobacco user in the home ($OR = 1.29$; 95% CI 1.25 – 1.35), and a male student ($OR = 1.11$; 95% CI 1.07 – 1.14). Compared to European Americans, more observed tobacco use on school grounds was reported by Latinos ($OR = 1.09$; CI 1.04 – 1.15) and less was reported by Others ($OR = .81$; 95% CI .76 – .87).

Controlling for a variety of individual-level variables (described below), the odds that students observed tobacco use on school grounds at the start of the study was .51; 95% CI .40 – .65, an effect that did not vary by treatment condition. However, the E PUP treatment condition versus the C condition at the town level was significantly associated with lower likelihood of students observing tobacco use on school grounds ($OR = .90$; 95% CI .88 – .93). This meant that the slopes for the E PUP and C condition were significantly different over waves one through four (See Figure 2).

Perceptions of Student Tobacco Use at School

A number of individual factors significantly increased the likelihood of participants perceiving students using tobacco at school at baseline: a greater number of friends who used tobacco ($OR = 1.11$; 95% CI 1.10 – 1.11), students who were in higher grade levels ($OR = 1.15$; 95% CI 1.15 – 1.16), students with an adult tobacco user in the home ($OR = 1.13$; 95% CI 1.11 – 1.14), and students who were female ($OR = .94$; 95% CI .94 – .96). Compared to European Americans, Latinos ($OR = .97$; CI .95 – .99) and Others ($OR = .81$; 95% CI .76 – .87) perceived less tobacco use at school.

Controlling for a variety of individual-level variables (described below), the odds that participants perceived students using tobacco at school at the start of the study was 1.42; 95% CI 1.37 – 1.49, an effect that did not vary by treatment condition. The E PUP treatment condition, in comparison to the C condition at the town level, was significantly associated with a lower likelihood of the participants perceiving students using tobacco at school ($OR = .98$; 95% CI .97 – .99). This meant that the slopes for the E PUP and C condition were significantly different over waves one through four (See Figure 3).

Perceptions of Tobacco Use Among Friends

A number of individual factors significantly increased the likelihood of students perceiving that their friends used tobacco at baseline: a greater number of friends who used tobacco ($OR = 1.60$; 95% CI 1.59 – 1.61), students who belonged to higher grade levels ($OR = 1.16$; 95% CI 1.16 – 1.17), and students who had an adult tobacco user in the home ($OR = 1.22$; 95% CI 1.20 – 1.25). Compared to European Americans, Latino students perceived that their friends used more tobacco ($OR = 1.06$; CI 1.03 – 1.09), and students labeled as “Other” perceived less tobacco use among friends than European Americans ($OR = .94$; 95% CI .90 – .98).

Controlling for a variety of individual-level variables (described below), the odds that students perceived that their friends smoked at the start of the study was .52; 95% CI .50 – .55, an effect that did not vary by treatment condition. However, the E PUP treatment condition, in comparison to the C condition at the town level, was significantly associated with lower likelihood of students perceiving their friends using tobacco ($OR = .98$; 95% CI .96 – .99). This meant that the slopes for the E PUP and C condition were significantly different over waves one through four (See Figure 4).

Discussion

Results from the present study suggest that enforcement of tobacco PUP laws may result in important ecological benefits for communities who use this tobacco prevention strategy. Specifically, PUP law enforcement may impact student perceptions of adolescent tobacco use within towns and schools. Over time, students in the E PUP condition reported observing less underage tobacco use in their town and at their school than students in the control condition. In addition, students in the E PUP condition perceived lower rates of tobacco use among their peers at school and friends over time than did students in the

control condition. Moreover, the results indicate that it is possible to confirm self-reported decreases in current smoking (Jason et al., 2008) by examining student observations and perceptions of adolescent tobacco use in towns and schools. Overall, the findings suggest that PUP laws can result in important changes in the amount of publicly visible youth tobacco use in a community, perceptions of youth tobacco use, and self-reported tobacco use.

A perception of a high prevalence of peer tobacco use in the environment is associated with stage of smoking uptake, and children who have smoked report more exposure to smoking friends, as well as perceptions of higher levels of smoking (Jackson, 1997). Additionally, youth who witness adolescent or adult smoking in various public locations are more likely to perceive smoking as a socially acceptable behavior (Alesci, Forster, & Blaine, 2003). It is possible that reducing the visibility of tobacco use, which appears to occur with PUP law enforcement, may decrease the effects of modeling and minimize the perception of illegal behavior as normal and acceptable within the community (Alesci, Forster, & Blaine, 2003; Jason, Pokorny, Sanem, & Adams, 2006; Jason, Pokorny, Turner, Freeland, Corbin, & Driscoll, 2005). Youth who do not witness others violating tobacco policies may themselves be less likely to use tobacco. Perceived peer tobacco use is a commonly cited predictor of underage smoking (Wills & Cleary, 1999); tobacco use is assumed to occur more when youth believe that it is a common and accepted behavior.

A number of other characteristics were related to observations of tobacco use and perceptions of tobacco use by peers and friends in this sample at baseline. It was understandable that the likelihood of students observing or perceiving tobacco was higher for children in higher grades and those who reported an adult tobacco user in the home. At baseline, females observed more tobacco use in towns and perceived more tobacco use among their peers; however, boys observed more tobacco use on school grounds. It is possible that boys are more likely to affiliate with those engaging in higher risk behavior at school. Racial/ethnic differences were also observed. As compared to Caucasians, students who described themselves as "Other" for race/ethnicity reported less observations of tobacco use in towns, and perceived lower rates of tobacco use among their peers at school and friends. In comparison to Caucasians, Latinos reported more friends using tobacco and more tobacco use occurring on school grounds, but less overall perceived tobacco use among peers at school. These findings supplement what has been found in other studies (Jason, Pokorny, Adams, & Hunt, 2008).

There are several limitations in this study. Because we needed to obtain active consent, we were only able to recruit about 50% of the available youth. Additionally, losses to follow-up were high. Finally, it is unclear what the longer term influence of PUP laws on tobacco use might be after youth finish high school.

This study provides evidence that police efforts to reduce underage tobacco use can have a positive spillover effect on the adolescent perceptions of observed tobacco use in their community and schools, as well as reductions in perceptions of student use among their peers at school and among their friends. It does appear that the E PUP intervention influenced important normative behaviors that could have influences throughout a community. Strategic enforcement of PUP law violations thus might bring added benefits to a community in terms of changing perceptions of youth tobacco observations and use, and these changes in norms might be the most important part of such policy tobacco interventions (Pokorny, Jason, & Schoeny, 2006).

Acknowledgments

The authors appreciate the funding provided by the National Cancer Institute (grant number CA80288). We also appreciate the help provided by Michael Schoeny in setting up the data set and data cleaning, as well as Jonathan Cook in statistical consultation during data analysis.

References

- Alesci N, Forster J, Blaine T. Smoking visibility, perceived acceptability and frequency in various locations among youth and adults. *Preventative Medicine* 2003;36(3):272–281.
- Altman DG, Wheelis AY, McFarlane M, Lee H, Fortmann SP. The relationship between tobacco access and use among adolescents: A four community study. *Social Science and Medicine* 1999;48:759–775. [PubMed: 10190639]
- Gottlieb NH, Loukas A, Corrao M, McAlister A, Snell C, Huang PP. Minors' tobacco possession law violations and intentions to smoke: Implications for tobacco control. *Tobacco Control* 2004;13:237–243. [PubMed: 15333878]
- Jackson C. Initial and experimental stages of tobacco and alcohol use during late childhood: Relation to peer, parent, and personal risk factors. *Addictive Behaviors* 1997;22:685–698. [PubMed: 9347070]
- Jason LA, Biglan A, Katz R. Implications of the tobacco settlement for the prevention of teenage smoking. *Children's Services: Social Policy, Research, and Practice* 1998;1:63–82.
- Jason, LA.; Hunt, YM.; Adams, ML.; Pokorny, SB.; Gadiraju, PB. Strengthening communities' youth access policies may facilitate clean indoor air Action. [Letter]. *Preventing Chronic Disease*. 2007 [Accessed Dec. 15, 2008]. http://www.cdc.gov/pcd/issues/2007/oct/07_0127.htm
- Jason LA, Pokorny SB, Schoeny M. Evaluating the effects of enforcements and fines on youth smoking. *Critical Public Health* 2003;13:33–45.
- Jason LA, Pokorny SB, Adams M, Hunt Y, Gadiraju P, Morello T, Schoeny M, Dinwiddie C. Youth caught in violation of tobacco purchase, use and possession laws: Education versus fines. *Behavior Modification* 2007;31:713–731. [PubMed: 17932232]
- Jason LA, Pokorny SB, Adams M, Hunt Y. A randomized trial evaluating tobacco possession-use-purchase laws. *Social Science & Medicine* 2008;67:1700–1707. [PubMed: 18947913]
- Langer L, Warheit G. Teen tobacco court: A determination of the short term Outcomes of judicial processes with teens engaging in tobacco possession. *Adolescent & Family Health* 2000;1(1):5–10.
- Lazovich D, Ford J, Forster J, Riley B. A pilot study to evaluate a tobacco diversion program. *American Journal of Public Health* 2001;91(11):1790–2001. [PubMed: 11684602]
- Ling PM, Landman A, Glantz SA. Is it time to abandon youth access tobacco programmes. *Tobacco Control* 2002;11:3–6. [PubMed: 11891349]
- Milton MH, Maule CO, Backinger CL, Gregory DM. Recommendations and guidance for practice in youth tobacco cessation. *American Journal of Health Behavior* 2003;27:159–169.
- Pokorny SB, Jason LA, Schoeny ME. Effects of retail tobacco availability on initiation and continued cigarette smoking. *Journal of Clinical Child and Adolescent Psychology* 2003;193–204. [PubMed: 12679277]
- Pokorny SB, Jason LA, Schoeny M. Youth supplying tobacco to other minors: Evaluating individual and town-level correlates. *Journal of Youth and Adolescence* 2006;35:705–715.
- Raudenbush, SW.; Bryk, AS.; Congdon, RT. HLM Version 6.03. Chicago: 2006.
- Rigotti NA, DiFranza JR, Chang Y, Tisdale T, Kemp B, Singer DE. The effect of enforcing tobacco sales laws on youths' access to tobacco and smoking behavior. *New England Journal of Medicine* 1997;337:1044–1051. [PubMed: 9321533]
- Tworek, C. Enforcement of tobacco possession, use, and purchase laws in relation to smoking behavior and attitudes toward smoking behavior among youth. State University of New York at Buffalo; 2004. Unpublished Dissertation
- Wakefield M, Chaloupka F. Effectiveness of comprehensive tobacco control programs in reducing teenage smoking in the USA. *Tobacco Control* 2000;9:177. [PubMed: 10841854]

- Wakefield M, Giovino G. Teen penalties for tobacco possession, use and purchase: Evidence and issues. *Tobacco Control* 2003;12 Suppl 1:i6–i13. [PubMed: 12773781]
- Wills TA, Cleary SD. Peer and adolescent substance use among 6th–9th graders: Latent growth analyses of influence versus selection mechanisms. *Health Psychology* 1999;18(5):453–463. [PubMed: 10519461]

Figure 1.
Observed Smoking in Town

Figure 2.
Observed Smoking in School

Figure 3.
Perceived Student Usage of Tobacco at School

Figure 4.
Perceived Friend Use of Tobacco