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Secondhand smoke avoidance by preteens living with smokers: To leave or stay?

Ding Ding, Dennis R. Wahlgren, Sandy Liles, Jennifer A. Jones, Suzanne C. Hughes, and
Melbourne F. Hovell

Center for Behavioral Epidemiology & Community Health, San Diego State University, 9245 Sky
Park Court, Suite 230, San Diego, CA, USA, 92123-4388

Ding Ding: dding@projects.sdsu.edu; Dennis R. Wahlgren: dwahlgren@projects.sdsu.edu; Sandy Liles:
sliles@projects.sdsu.edu; Jennifer A. Jones: jjones@projects.sdsu.edu; Suzanne C. Hughes: shughes@projects.sdsu.edu

Abstract

Introduction—Secondhand smoke (SHS) is hazardous to children's health. Designing interventions to reduce exposure requires understanding children's behavior in the presence of smokers, yet little is known about this behavior.

Purpose—To determine whether children's avoidance of SHS is associated with lower exposure and to explore predictors of avoidance based on a behavioral ecological model.

Method—Preteens aged 8–13 (N=358) living with a smoker identified their primary source of SHS exposure, and reported whether they left (avoided exposure) or stayed the last time they were exposed to that person's smoke. The SHS avoidance measure was validated by examining associations with SHS exposure. Multivariable Logistic Regression was used to determine predictors of SHS avoidance.

Results—Based on urine cotinine and reported exposure, preteens who left the presence of SHS had lower exposure than those who stayed. Preteens were more likely to leave SHS if they were less physically mature, had not tried smoking, had a firm commitment not to smoke, did not assist family smoking, had family/friends who discouraged breathing SHS, or had friends who disliked smoking.

Discussion—Most SHS exposure reduction interventions have targeted changes in smokers' behavior. Reductions can also be achieved by changing exposed nonsmokers' behavior, such as avoiding the exposure. Future studies should measure young people's SHS avoidance and test interventions to increase their avoidance practices.

Keywords

Secondhand smoke (SHS); Avoidance; Children; Youth; Ecological model

1. Introduction

Secondhand smoke (SHS) is a major hazard to public health (United States Department of Health and Human Services [USDHHS], 2006), particularly to the health of children (USDHHS, 2007). Children are susceptible to SHS related diseases (Li & Peat, 1999; Lieu &

Corresponding Author: Melbourne F. Hovell: mhovell@projects.sdsu.edu, Telephone: 001-858- 505-4770, Fax: 001-858 505-8614.

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Feinstein, 2002; Pinkerton & Joad, 2006), such as respiratory and middle ear infections, asthma, decreased lung function, and behavioral problems (DiFranza, Aligne, & Weitzman, 2004; Mbulo, 2008; Williams et al., 1998). Furthermore, children's exposure to SHS may contribute to smoking initiation during adolescence (Becklake, Ghezzo, & Ernst, 2005). In the United States, about 60% of children aged 3–11 years were exposed to SHS, and about 25% reported living with at least one smoker (USDHHS, 2007).

A number of factors determine degree of exposure, including the source (e.g., type, magnitude, duration of smoking), the physical context (e.g., indoor vs. outdoor, room size, ventilation, distance from the source), and the individual who is exposed (e.g., respiratory rate) (Florescu et al., 2009; Jaakkola & Jaakkola, 1997). SHS exposure reduction can be achieved by manipulating at least some of these factors. Most previous interventions have been designed to change the source of exposure by modifying the behavior of smokers. In pediatric contexts, interventions have focused on smoking cessation or on changing smoking patterns of the caregivers (Emmons et al., 2001; Gehrman & Hovell, 2003; Klerman, 2004). However, these attempts were not always successful in reducing children's exposure (Priest et al., 2008).

An understudied aspect of SHS reduction is the behavior of the exposed individuals (Tyc, Hovell, & Winickoff, 2008). Individuals can reduce or avoid exposure via several behaviors, such as leaving the smoker (Wang, Herting, & Tung, 2008), asking the smoker to stop smoking (Willemsen & de Vries, 1996), and telling a smoker that his/her cigarette smoke is bothersome (Thrasher, Boado, Sebrie, & Bianco, 2009). These behaviors are functionally similar and represent a generalized response class, i.e., SHS avoidance (Catania, 1998; Hovell, Wahlgren, & Gehrman, 2002). The current study examined one member of the SHS avoidance response class: leaving the smoker during exposure. Research shows that SHS prevention behaviors are influenced by a number of environmental factors, including family smoking practices, modeling of smoking behaviors, and societal disapproval of smoking (Ji et al., 2009; Martinez-Donate et al., 2008; Thrasher et al., 2009).

This study was a cross-sectional analysis of SHS avoidance among preteens who lived with a smoker. The preteen years overlap pubertal development, a rapid physiological and behavioral transition from childhood to adolescence (Coleman & Coleman, 2002). Pubertal stage is associated with multiple health behaviors (Schmitz, 2004). The study sample provides an opportunity to explore the association between pubertal stage and risk avoiding practices. Because the preteen years are a critical period for smoking initiation and related risk behaviors (Bush et al., 2005; Choi, Gilpin, Farkas, & Pierce, 2001; Orlando, Tucker, Ellickson, & Klein, 2004), it is especially important to determine whether preteens are mature enough to take initiative in avoiding SHS.

The Behavioral Ecological Model (BEM) is used to guide the study design, hypotheses and analyses (Hovell & Hughes, 2009; Hovell, Wahlgren, & Adams, 2009; Hovell, Wahlgren, & Gehrman, 2002). This model emphasizes a multi-level ecological framework of personal, historical, and environmental influences on behavior. This paper targets proximal influences, including families and friends. Based on the BEM, preteens' SHS avoidance is an outcome of physiological and social reinforcement for previous behavior, interacting with a current context. We hypothesized that preteens were more likely to avoid SHS if they had not experimented with tobacco and were not susceptible to smoking (e.g. if they had pleasant subjective reactions to SHS), if they had been discouraged by families and friends from breathing SHS, and if they had not received social reinforcement for staying during exposure.

This paper was designed to: 1) determine the preteen's primary source of SHS exposure (i.e., the person who most often exposed the preteen to cigarette smoke), and the percentage of preteens who left the area when exposed by the primary source, 2) examine the association

between avoidance and SHS exposure as a validation of the avoidance measure, and 3) explore correlates of SHS avoidance.

2. Method

2.1 Study Sample

The study sample consisted of parent-child pairs who participated in the baseline measure for a controlled trial of SHS exposure reduction among preteens. Families were eligible to participate if they had a child aged 8 to 13 living with a smoker. Families in San Diego County, CA were recruited from various local sources, including community organizations, schools, stores, supermarkets, health fairs, festivals, etc. Low-income families were targeted due to their higher smoking prevalence. Between 2004 and 2007, 18,673 contacts were made, 1,837 telephone screenings were conducted, and 617 families were identified as potentially eligible based on a child in the specified age range and a smoker living in the home who had smoked in the home or car in the past 30 days. About 63% of these families (n= 388) completed the baseline surveys, with 19% refusing, 13% not reachable, and 5% not continuing due to other reasons. Of the 388 families who completed baseline, 28 were excluded due to incomplete data on the preteen's SHS avoidance, and two were excluded because the preteens reported smoking in the last 30 days, which might confound measures of urine cotinine as an indicator of exposure. The final sample comprised 358 families.

In each participating family, a primary care giver (85% biological mother) volunteered to serve as the "target parent" (TP), and an eligible child was identified as the "target child" (TC). If the family had more than one child meeting the inclusion criteria, the one with the birthday closest to the date of the interview was selected as the TC. Cash incentives were provided to both TP and TC. The San Diego State University Institutional Review Board approved all procedures of the study.

2.2 Measures

At the baseline assessment, trained interviewers conducted face-to-face interviews in English or Spanish with the TP and TC in their home. Interviews assessed demographic characteristics of the child and parent, developmental status of the child, smoking practices in the home, SHS exposure, and smoking-related practices of family and friends.

2.2.1 Primary outcome variable

SHS avoidance: The TC's primary source of SHS exposure was identified by the question, "Whose cigarette smoke are you around most often?" Children who identified a primary source of exposure were then asked: "Think about the last time you breathed [NAME]'s smoke. When [NAME] started smoking, did you stay there or did you leave?" Staying versus leaving served as the primary dependent variable; leaving is referred to in this paper as "avoidance".

2.2.2 Validation variables—Successful avoidance of SHS should reduce exposure. We assessed the validity of the avoidance measure using two types of criteria: biomarker and report of exposure.

Biomarker of SHS exposure: A urine sample was collected from the TC at the end of the interview. The sample was analyzed for cotinine, a metabolite of nicotine, using isotope-dilution liquid chromatography-tandem mass spectrometry. This method has a level of detection of 0.02 ng/mL, and a level of quantitation of 0.10 ng/mL. The split-half reliability correlation for blind re-tests was 0.99 ($p < 0.001$). Urine cotinine is subject to individual metabolic variability and is influenced by environmental nicotine contamination (Matt et al.,

2004), but it is considered a reliable and valid measure of SHS exposure (Benowitz, 1996; Florescu et al., 2009).

Reported cigarette exposure: Previous studies suggest that measures of SHS exposure incorporating multiple interview questions yield valid results (Matt, Bernert, & Hovell, 2008; Matt et al., 2000). The child's recent exposure to cigarettes was reported by both the TP and the TC using a timeline follow-back method (Fals-Stewart, O'Farrell, Freitas, McFarlin, & Rutigliano, 2000; Lam, Fals-Stewart, & Kelley, 2009). To prompt accurate recall, exposure was assessed for specific time periods each day (morning, afternoon, and evening), in specific locations (in the home, in the car, other), and by a specific smoker (target parent, other parent, other person). The TP and TC were separately asked to recall the number of cigarettes to which the TC was exposed on each of the seven days prior to the interview. Reports by both respondents were included because prior analyses on the same sample showed that TP and TC reports, although overlapping, explained unique portions of variance in exposure as measured by cotinine (Johnson-Kozlow et al., 2010).

From the TP and TC's timeline follow-back reports, we computed the average number of cigarettes per day to which the TC was exposed over the last 3 and 7 days prior to the interview. The 3-day recall was selected so as to provide a comparison to cotinine criterion; the previous 3 days captures exposure that is most influential on urine cotinine (half-life of about 24 hours). However, depending on the day measures were collected, the 3-day recall could be affected by inclusion or exclusion of weekend days, for which exposure may differ substantially from weekdays. Thus the 7-day recall was also examined to ensure that both weekdays and weekends were included.

2.2.3 Tested predictors of avoidance

Preteen smoking: The TC was asked "Have you ever smoked a cigarette?" and "Have you ever tried smoking, even a few puffs?" Susceptibility to smoking among never-puffers was computed using the Adolescent Smoking Susceptibility Scale (Pierce, Choi, Gilpin, Farkas, & Merritt, 1996; Choi et al., 2001). This measure classifies youths as susceptible to smoking if they lack a firm commitment not to smoke, and is a demonstrated predictor of smoking initiation among preteens and adolescents (Jackson, 1998; Pierce et al., 1996). The TC's smoking status was categorized as "tried" (including both puffers and experimenters), "not tried, susceptible", and "not tried, not susceptible".

Sensitivity to SHS: Due to the lack of precedence in assessing sensitivity to SHS, we have adapted items commonly used for assessing sensitivity to the first smoked cigarette (Eissenberg & Balster, 2000; Lessov-Schlaggar et al., in press; Meliska & Gilbert, 1991; Pomerleau, 1995). The TC was asked whether s/he ever had any of the following reactions when exposed to SHS: dizziness, nausea, rush/buzz, heart pounding, or coughing/choking. The number of reactions endorsed was coded on a 0–5 point index, with higher numbers indicating higher sensitivity to SHS.

Family influence

1. Assisting family members with smoking. Preteens were asked whether family members had asked them to buy cigarettes, bring cigarettes, empty ashtrays, or light cigarettes. Emptying ashtrays and buying cigarettes were not selected for analysis due to the low frequency of occurrence.
2. Family discouragement. The literature has explored the degree to which smoking and other risk practices are associated with positive social images and social consequences (e.g., "being cool") (Chassin, Presson, Rose, & Sherman, 1996; Eissenberg, Ward,

Smith-Simone, & Maziak, 2008; Wahlgren et al., 1997). We were interested in the opposite: de-glamorizing consequences delivered by others. Thus, family discouragement of breathing SHS was measured by asking “In the last 30 days, did anyone in your family tell you or do something to make you feel that breathing other people’s smoke is ‘uncool’?”

3. Home smoking bans. The presence of a home smoking ban was measured by TC report of smoking rules in the home: “no smoking is allowed ever”, “smoking is allowed for certain people or in certain areas”, or “smoking is allowed any time”. The variable was dichotomized into “complete ban” versus “partial/ no ban” as suggested by the literature (Hughes et al., 2008; Martinez-Donate, Hovell, & Wahlgren, 2003; Wakefield, Banham, & Martin, 2000).

Friend influence

1. Friend smoking. Friends’ smoking status was measured by the TC’s response to: “How many of your friends use any type of tobacco, such as cigarettes, cigars, bidis, etc.?” Due to positive skew, the variable was dichotomized “zero” and “one or more”.
2. Friend discouragement. TC was asked: “In the last 30 days, did any of your friends tell you or do something to make you feel that breathing other people’s smoke is ‘uncool’?”
3. Friend dislike of smoking. The TC was asked “How many of your friends told you that they do not like it when others smoke?” Responses included 1 (none), 2 (some) and 3 (most of them). This was a proxy measure for the prevalence of disliking smoking/SHS among preteens’ friends, and we expected greater SHS avoidance among those with more friends who dislike smoking.

Pubertal maturity: The current study examined developmental status using the Pubertal Development Scale (PDS) (Petersen, Crockett, Richards, & Boxer, 1988; Schmitz et al., 2004). This validated measure, completed by the TP, consists of five gender-specific questions, covering domains of growth in height, body hair, and secondary sexual characteristics. Scores, ranging from 1 to 4 on each of five items, were averaged to produce a single score on a scale of 1–4, with higher scores representing more advanced development.

Knowledge of smoking/SHS harms: The TC was asked to endorse two statements: “How much do you think that cigarette smoking is bad for your health?” and “How much do you think that breathing other people’s cigarette smoke is bad for your health?” Responses ranged 1 (none) to 4 (a lot).

2.3 Statistical Analysis

2.3.1 Avoidance and SHS Exposure—To explore the validity of the avoidance measure, urine cotinine and reported cigarette exposure were compared between those who left and those who stayed. Urine cotinine was log transformed to reduce positive skew, and a t-test was conducted to compare mean log cotinine values. The distributions for reported exposure were highly skewed beyond repair by transformation. Thus, Mann-Whitney U tests were used for these group comparisons.

2.3.2 Correlates of SHS avoidance—Bivariate analyses (chi-square and t-tests) were conducted to screen for variables individually related to SHS avoidance. Following Hosmer & Lemeshow (2002), variables with a significance level $p < 0.25$ were included in logistic regression analyses. To avoid Type II error in exploratory model-building, variables attaining the more liberal significance level $p < 0.10$ were retained in the model. Demographic variables

remained in the model regardless of significance. All statistical tests were two-tailed with an alpha level of 0.05. Analyses were conducted using SPSS 15.0 (SPSS Inc, Chicago, IL).

3. Results

3.1 Sample Characteristics

Table 1 presents characteristics of the study sample. The TC identified the primary source of SHS exposure as: mother (43%), father (29%), grandparent (10%), and other (18%). During their most recent exposure by the primary source, 74% of preteens avoided SHS exposure by leaving the smoker's presence. More preteens left if the smoker was a grandparent (78%), compared to mother (69%), father (75%), or other (70%), but the overall differences were not statistically significant ($p=0.621$).

3.2 Avoidance and SHS Exposure

TCs who left the primary source of SHS exposure had significantly less cigarette exposure based on TC reports for the last 3 and 7 days prior to the interview (Table 2). Similar patterns, though only near significant ($p<0.10$), were found for TP reports and for urine cotinine.

3.3 Correlates of SHS avoidance

In addition to demographic variables, the following variables were retained based on the bivariate analysis with a criterion of $p<0.25$: PDS score, TC smoking, TC sensitivity to SHS, family discouragement, assisting family members with smoking, home smoking ban, friend smoking, friend discouragement, and friend dislike of others smoking. Knowledge of the harms of smoking had insufficient variance for further analysis (91% reported "a lot") and knowledge of SHS harms did not meet the bivariate selection criteria for further analyses ($p=0.680$).

Table 3 presents the unadjusted and adjusted odds ratios for associations between SHS avoidance and independent variables in the regression model. Although age and race showed bivariate associations with SHS avoidance, no demographic variables remained significant after adjusting for other variables. Based on results of logistic regression, preteens were more likely to avoid SHS if they had the following characteristics: lower PDS scores, did not experiment with or were not susceptible to smoking, family members did not ask TC to assist smoking, family members discouraged TC from breathing SHS, friends discouraged TC from breathing SHS, and friends disliked others smoking. The association between SHS avoidance and home smoking bans approached significance ($p=0.086$). TC sensitivity to SHS, and friends smoking did not meet the $p<0.10$ selection criterion and were therefore not entered into the logistic regression model.

4. Discussion

Exposure to SHS involves behavior of at least two people: a smoker and an exposed individual. While most efforts to reduce SHS exposure among both adults and children have focused on changing smokers' behavior, little attention has been paid to the behavior of the exposed individuals. We believe this study is the first to determine theoretical predictors of SHS avoidance behavior among preteens.

SHS avoidance is an important target for intervention, and it is also a key outcome measure for interventions. As a target for intervention, avoidance represents a class of behaviors (e.g. leaving, asking the smoker to leave or to stop smoking). Avoidance can also generalize to different settings. Unlike interventions that reduce exposure from a limited number of smokers (e.g., parents), training children to avoid SHS may protect them in a wide variety of situations. Secondly, increasing SHS avoidance may also reduce the likelihood of smoking initiation, e.g.,

if the child avoids peer smokers. Finally, avoiding smokers may function as an aversive social consequence that might contribute to smoking less or cessation on the part of smokers. Hofstetter et al. (2010) found that reprimands by nonsmokers were negatively associated with current smoking.

Most SHS reduction interventions among children relied on measures of exposure (e.g., cotinine biomarkers) as the primary outcome. However, while exposure is the endpoint of interest for health risk, the more proximal and relevant outcome for testing the efficacy of *behavioral* interventions is whether the targeted *behaviors* were changed. The current study examined preteens' SHS avoidance as a protective behavior. Results indicated that many preteens left smokers to avoid SHS, and that avoidance was associated with lower exposure. This supports the validity of "leaving" as a measure of avoidance. It also suggests the importance of avoidance as a mechanism to reduce exposure, and as a defined target for intervention.

The present results indicate that preteens' SHS avoidance behavior is strongly influenced by their own smoking history and social environment. Specifically, preteens' previous smoking experience might make SHS less aversive and perhaps even reinforcing, increasing the likelihood of staying in the presence of SHS. Compliance with parents' or other family members' requests to assist when they smoke may reflect social reinforcement. Conversely, attempts to leave the area following such requests may result in criticism or other punishing consequences that may lead to staying while a parent smokes. Similarly preteens may be reinforced for avoiding SHS if they have families and friends who discourage breathing SHS. These findings have extended the literature on social influences on other SHS prevention behaviors, such as enforcing home smoking bans and providing anti-smoking cues to smokers (Ji et al., 2009; Martinez-Donate et al., 2008; Thrasher et al., 2009). Together, these studies imply potential for engineering the social environment based on behavioral principles (Hovell, Wahlgren, & Adams, 2009) to promote a range of SHS avoidance behaviors.

The current study provided little evidence for an association between SHS avoidance and knowledge of smoke-related harms. Among the preteen participants, more than 90% agreed that smoking harms health *a lot*, and more than 80% agreed that SHS harms health *a lot*, yet knowledge of harm was not related to SHS avoidance. This suggests that knowledge-based interventions may not be effective in promoting SHS protection behavior because the current level of knowledge is already high, and the health consequences of SHS may not be immediate enough to promote behavior change.

In this study, apparent physical maturity had a more robust association with SHS avoidance than did age, and preteens who appeared more mature were less likely to avoid SHS. The PDS measure accounts for developmental differences between individuals of the same age, and especially of different genders, as girls tend to mature 1–2 years earlier than boys (Huddleston & Ge, 2003). The association observed here may reflect differential social reinforcement from audiences (e.g., parents, older teens, etc.) who may respond to preteens based on their physical appearance of maturity. This could include promoting smoking or at least tolerating SHS exposure based on a presumption that the more mature child is less vulnerable. Conversely, children who appear less mature may prompt the smoker (especially if a parent) to protect them from SHS. In this case, a smoker may leave to smoke elsewhere, or ask the child to leave. Future studies should determine the mechanisms by which pubertal status predicts SHS avoidance.

This study suggests that changing family and peer cultures with respect to SHS may be critical to promoting youth avoidance of SHS. While no other studies have addressed preteens' ability to leave the smoker during exposure, our findings suggest that interventions to assist the child

to leave need to be directed to changes in family practices and/or peers' support for or opposition to tobacco and SHS. Longitudinal studies are also important to determine whether the association between avoidance and maturity reflects predominantly biological changes (e.g., less aversive reactions to smoke) and/or changes in social (e.g., family, peer) contexts.

The current study is one of the first to examine "leaving the smoker". The validity of the SHS avoidance measure was supported by consistent patterns of association with both reports and biomarker of SHS exposure. The association of SHS avoidance with theoretically derived predictors lends additional support to construct validity.

Results should be interpreted in light of limitations. The study sample consisted of families with a resident smoker and an exposed preteen, recruited from low-income/high-risk communities in San Diego County. The sample was not necessarily representative of broader populations. However, this limitation may apply more to prevalence rates than it does to functional relations (i.e., associations) between variables (Hovell et al., 1996).

A second limitation was the possibly under-specified dependent variable. The measure of "leaving the smoker" only concerned the primary source of SHS, without addressing other sources (e.g., friends and incidental exposure in public settings). It captured only the last exposure by this person and omitted any further information about how recent the last exposure was, or whether the instance was typical or atypical for that child. Measures of the most recent event may have greater reliability and validity than a more extensive measure (i.e., for a longer recall period), though at the expense of generalizability. The measure only concerned one behavior in a class of SHS avoidance behaviors, and did not specify whether the TC initiated leaving or the TC was asked to leave. Future studies should improve the current measure by explicitly defining a recall period, assessing multiple behaviors in the SHS avoidance response class, quantifying the frequencies (i.e., typicality) of each behavior, and clarifying context of each response behavior (e.g. how the smokers or others contribute to leaving or staying).

Reducing SHS exposure among children is a current public health priority (USDHHS, 2006). This study emphasized the importance of studying children's SHS avoidance. Refining future interventions will require precise knowledge of the determinants of avoidance and similar behavioral outcomes. Future studies should develop more specific measures for SHS avoidance, and more thoroughly evaluate ecological contexts of behavior, to better inform interventions for SHS exposure reduction.

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Table 1

Descriptive statistics for demographic characteristics and variables related to secondhand smoke (SHS) avoidance (n=358)¹

Characteristics	Mean	SD
Age	10.4	1.6
Pubertal Development Scale score ²	1.9	0.7
Sensitivity to SHS index ³	2.0	1.3
	n	%
Gender		
Female	191	53.4
Male	167	46.6
Ethnicity		
Non-Hispanic	164	54.2
Hispanic	194	45.8
Race		
White	147	41.1
Black	118	33.0
Other	90	25.1
Smoking status		
Not tried, not susceptible	236	65.9
Not tried, susceptible	89	24.9
Tried	31	8.7
Home smoking bans		
Partial/no bans	156	43.6
Complete bans	202	56.4
Assisting family members smoking		
No	174	48.6
Yes	183	51.1
Family discouraged SHS		
No	183	51.1
Yes	174	48.6
Friends smoking		
No	311	86.9
Yes	47	13.1
Friends discourage SHS		
No	226	63.1
Yes	132	36.9
Friends dislike others smoking		
None	101	28.5
Some	112	31.3
Most or all	142	39.7
Knowledge of the harm of smoking		

Characteristics	Mean	SD
None/not much/some	33	9.2
A lot	324	90.8
Knowledge of the harm of SHS		
None/not much/some	68	19.0
A lot	289	81.0

¹ Numbers may not sum to 358 due to missing data.

² 1–4 point scale, higher numbers representing more complete pubertal development.

³ 0–5 point index, higher numbers indicating higher sensitivity to SHS.

Table 2

Comparison of secondhand smoke (SHS) exposure, by report and by biomarker, between preteens who left and who stayed during the most recent exposure (n=358)

Timeline follow-back reports (cigarettes/day)	TC left	TC stayed	<i>p</i> -value
	Median (25 th , 75 th Percentile)	Median (25 th , 75 th Percentile)	
TC reported SHS for last 3 days	0.67 (0.00, 1.67)	1.00 (0.33, 2.75)	0.006 ¹
TP reported SHS for last 3 days	1.00 (0.33, 4.17)	1.67 (0.33, 6.00)	0.068 ¹
TC reported SHS for last 7 days	0.57 (0.14, 1.57)	0.86 (0.29, 2.71)	0.012 ¹
TP reported SHS for last 7 days	1.29 (0.29, 3.93)	1.57 (0.57, 6.00)	0.075 ¹
Biomarker	Geometric Mean (95% CI)	Geometric Mean (95%CI)	<i>p</i> -value
Urine Cotinine (ng/mL)	1.51 (1.26, 1.80)	2.04 (1.46, 2.84)	0.095 ²

¹Mann-Whitney U tests

²Two sample t-test

Table 3

Unadjusted and adjusted odds ratio (OR) for associations between secondhand smoke (SHS) avoidance and sociodemographic, developmental, behavioral, and environmental variables (n=358)

Variables	Unadjusted OR (95% CI)	Adjusted ^I OR (95% CI)
Age	0.84 (0.72, 0.97) *	1.05 (0.86, 1.28)
Gender		
Female	1.00	1.00
Male	1.11 (0.69, 1.79)	0.89 (0.49, 1.60)
Ethnicity		
Non-Hispanic	1.00	1.00
Hispanic	0.88 (0.47, 1.68)	0.85 (0.44, 1.64)
Race		
White	1.00	1.00
Black	1.22 (0.72, 2.10)	1.38 (0.71, 2.65)
Other	2.11 (1.12, 4.01) *	1.99 (0.94, 4.22)
Pubertal Development Scale score	0.58 (0.42, 0.81) **	0.58 (0.35, 0.93) *
Smoking status		
Not tried, not susceptible	1.00	1.00
Not tried, susceptible	0.49 (0.29, 0.84) **	0.44 (0.24, 0.81) **
Tried	0.32 (0.15, 0.69) **	0.37 (0.15, 0.93) *
Home smoking bans		
Partial/no bans	1.00	1.00
Complete bans	1.91 (1.18, 3.07) **	1.56 (0.90, 2.69)
Assisting family members smoking		
No	1.00	1.00
Yes	0.41 (0.25, 0.68) **	0.48 (0.28, 0.84) *
Family discouraged SHS		
No	1.00	1.00
Yes	2.00 (1.24, 3.26) **	1.44 (0.81, 2.56) *
Friends discouraged SHS		
No	1.00	1.00
Yes	2.34 (1.36, 4.00) **	1.73 (1.01, 3.07) *
Friends disliked others smoking		
No	1.00	1.00
Yes	1.46 (1.09, 1.95) *	1.52 (1.08, 2.15) *

^I OR from the logistic regression with all variables in the model

* p<0.05,

** p<0.01,