Validity of Assessments of Youth Access to Tobacco: The Familiarity Effect

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Objectives. We examined the standard compliance protocol and its validity as a measure of youth access to tobacco.

Methods. In Study 1, youth smokers reported buying cigarettes in stores where they are regular customers. In Study 2, youths attempted to purchase cigarettes by using the Standard Protocol, in which they appeared at stores once for cigarettes, and by using the Familiarity Protocol, in which they were rendered regular customers by purchasing nontobacco items 4 times and then requested cigarettes during their fifth visit.

Results. Sales to youths aged 17 years in the Familiarity Protocol were significantly higher than sales to the same age group in the Standard Protocols (62.5% vs. 6%, respectively).

Conclusions. The Standard Protocol does not match how youths obtain cigarettes. Access is low for stranger youths within compliance studies, but access is high for familiar youths outside of compliance studies. (*Am J Public Health.* 2003;93:1883–1886)

Foremost among policy-level efforts to reduce youth access to tobacco are the federal *Synar Amendment*[1,2] and the subsequent state[3,4] and local[5] implementations of the amendment. *Synar* requires all states to decrease sales of tobacco to children to ≤20% of their purchase attempts by 2003 and to provide empirical evidence of progress toward that goal to the Substance Abuse and Mental Health Service Administration (SAMSHA). The methodology that SAMSHA mandated for acquiring such evidence entails sending youth confederates (nonsmokers) to attempt to purchase cigarettes in a random statewide sample of stores.[6,7] Studies conducted as prescribed indicate that youth access to tobacco decreased from 60% to 90% before legislation to 6% to 30% after legislation nationwide[8] and in California in particular.[9,10]

Simultaneously, however, youths report that their access to tobacco remains high: their perceived[5,10–13] and reported[10,11] access to tobacco significantly exceeds measured access in the same communities for reasons that remain unclear. We conducted 2 studies to explain this measured versus reported access discrepancy. In Study 1, youth smokers were interviewed about the methods they use to acquire tobacco from store clerks to test the hypothesis[14] that the behavior of youths who genuinely desire cigarettes differs from that of youth confederates in compliance studies. In Study 2, youths attempted to purchase tobacco by using either the standard (SAMSHA) method or the method suggested by the Study 1 youth smokers to test the hypothesis[14] that the latter (youths reported access) significantly exceeds the former (measured access).

METHODS

Study 1

Method. Undergraduate Research Assistants (RAs) were trained to conduct a standardized Youth Access Methods Interview in an informal manner. RAs practiced this with researchers and with adult-student smokers on campus before conducting interviews with youth smokers in the field. RAs then visited youth hangouts (e.g., malls, video game parlors, trolley stops, beaches) in San Diego, Calif, between 3:00 PM and 8:00 PM over a 10-month period in 2001, and they interviewed all youths who were smoking. Diversity of youth smokers was ensured by randomly selecting hangouts in Black, White, Hispanic/Latino, and Asian neighborhoods. The number of youth smokers at any hangout ranged from 1 to 7. Youths were approached by two RAs; one interviewed them while the other recorded their responses.

Interview. Youths were asked their age and ethnicity, whether they buy cigarettes, and if so where they buy them. They also were asked whether they have ever used any of the following methods to acquire cigarettes (with the option to endorse more than 1): (1) buying in their own neighborhood, (2) buying from a clerk who knows them, (3) saying that the cigarettes are for an adult, (4) bringing a fake note from their parents stating that the cigarettes are for the parents (5) providing false identification (ID), (6) lying about being underage, and (7) buying nontobacco items at the same time. The final open-ended question asked what someone aged 16 years should do to acquire cigarettes from a store clerk and for any additional methods that the youths have used.

Results. The 276 youth smokers in our study included 153 boys (55.4%) and 123 girls (44.6%) aged 12 to 17 years (mean age=15.83) who represented a diversity of ethnic groups (White=38.7%, Black=15.1%, Hispanic/Latino=22.9%, Asian=15.5%, other=7.7%). Most (54.8%) reported buying their own cigarettes, and preferred places to buy because of perceived and reported easy access were liquor stores (70.7%), gas stations (58.4%), small grocery stores (51.2%), and convenience stores (48.8%). Of the various methods for acquiring tobacco, most youths reported buying in their own neighborhood (77.2%), buying from a clerk who knows them (72.8%), and lying about being underage (71.2%). Less common methods were buying nontobacco items at the same time (59.9%), saying that the cigarettes are for an adult (24.5%), using fake ID (23.6%), and bringing a fake note from their parents (7.1%). All youths recommended that 16-year-old smokers buy tobacco from clerks who know them as the method to ensure acquisition of cigarettes. An additional method used by a few is to take the trolley to Tijuana, Mexico, where clerks do not ask age or require ID and where cigarettes are cheaper ($16 per carton in Mexico vs $40 per carton in San Diego).

Discussion. The most common method used by youths to acquire tobacco is to buy tobacco from clerks who recognize them as regular customers and, hence, to buy in their own neighborhoods. Youths' comments about this strategy (e.g., "If a clerk knows you, he'll sell you *anything*") indicated keen awareness of the familiarity effect, i.e., greater liking and trust and, therefore, compliance with requests from familiar youths versus stranger youths.[14] This youth-smoker method differs from the widely used standard method in which youths attempt to purchase tobacco in stores where they are strangers to the clerks. Hence, we compared the youth-smoker method with the standard method to test the hypothesis that cigarette sales are higher to youths with whom clerks are familiar.

Study 2

Youth. Eighteen (11 boys, 7 girls) youth confederates aged 15 to 17 years (aged 15 years=5, aged 16 years=9, aged 17 years=4) participated in our study. Fourteen were White, 1 was Black, and 3 were Hispanic/Latino.

Stores. Two hundred thirty-two small grocery and convenience stores were randomly selected from 22 cities in San Bernardino and Riverside Counties, Calif.

Procedure. We obtained immunity from prosecution for all study participants (i.e., youths, RAs, San Diego State University, authors, store clerks, and stores) from the district attorneys. E-mail messages and flyers then were used to inform the university community of the project. All youths selected were children of university faculty, staff, and students. Each minor and his/her parent(s) were interviewed prior to inclusion in the project. This entailed a description of the study, written consent forms for both parents and minors, and assessment of each minor by a licensed clinical psychologist to ascertain youth comprehension of the study and the risk for tobacco or other substance use. Only youths who were able to understand the purpose of the study, who did not smoke, and who did not appear to be at risk for smoking or substance abuse were selected to be youth confederates. They were paid for their tobacco purchase attempts (PAs) irrespective of success.

Training Youth and RAs. Prior to data collection, youth confederates and RAs participated in training. Youth training included a 2-hour educational session designed to discourage tobacco use and instruction in the study's methods. All youths were trained to make tobacco PAs in the same manner by memorizing a PA script and then by role-playing. Youths also were shown photographs in the lab to train them in categorizing clerks as White, Black, Hispanic/Latino, Asian, or other until 100% agreement among youths was achieved. Quality control of these standardization procedures was ensured via monthly retraining sessions. RAs participated in this training as well as in training to ensure youths' safety. RAs recorded the data obtained by youths on the ethnicity of clerks immediately after the PA. RAs also supervised the money used to make purchases, and they confiscated the tobacco and any remaining money when youths returned to the car. One RA accompanied each minor to the store and remained inconspicuous during PAs. These procedures have been used previously[9,15–17] and have effectively selected youths not at risk for smoking, standardized youths' PAs, and ensured youths' safety.

Tobacco PAs. All PAs transpired between 3:00 PM and 7:00 PM on weekdays and between 9:00 AM and 4:00 PM on weekends. The PAs were scheduled such that stores were visited by no more than 7 youths per week (i.e., 1 minor per day at a different time of day and with a different clerk). Youths used 4 different purchase protocols, in the following order, when attempting to purchase cigarettes: Standard Protocol Time 1 (N=232 PAs), Familiarity Protocol (N=231 PAs), Standard Protocol Time 2 (N=227 PAs), and Standard Protocol Time 3 (N=225 PAs) for a total of 915 PAs. There were 4 to 6 weeks between protocols, and youths participated in multiple protocols but in only 1 protocol per store. Decreasing PAs across protocols reflect stores that closed during the study.

In the Standard Protocols, youths entered each store (where they had never been seen before), walked to the counter, and asked the clerk, "May I buy a pack of Marlboro, please?" In the Familiarity Protocol, youths went to each store 4 times over 6 to 8 days at the same time of day. They sought out the same clerk and purchased small items (e.g., soda, candy) from, and were friendly with, that clerk. On the fifth visit, youths entered the store (at that same time of day), walked to the counter with the same clerk, and asked, "May I buy a pack of Marlboro, please?"

Results. A stepwise logistic regression predicted sold/not sold cigarettes from purchase protocol, youth ethnicity (White, Black, Hispanic/Latino), youth age (15,16, and 17 years), youth sex, clerk sex, and clerk ethnicity (White, Black, Hispanic/Latino, other). As shown in Table 1, protocol was the best predictor of cigarette sales: youths in the Familiarity Protocol were 5.5 times more likely than those in the Standard Protocols to be sold tobacco, with no significant differences in sales among the Standard Protocols. Youth access rates (across youth age and ethnicity) were Standard Protocol Time 1=6.5%, Familiarity Protocol=24.3%, Standard Protocol Time 2=11.0%, and Standard Protocol Time 3=8.4%. However, youth age also predicted sales: youths aged 16 years were 3.5 times more likely and youths aged 17 years were 8 times more likely than youths aged 15 years to be sold tobacco. Hence, access rates by age in the Familiarity Protocol were youths aged 15 years=8.0%, youths aged 16 years=23.6%, and youths aged 17 years=62.5%. Likewise, youth ethnicity contributed to sales, with Hispanic/Latino youths 5 times more likely than White youths to be sold tobacco. Thus, access rates by ethnicity in the Familiarity Protocol were White youths=24.4%, Black youths=20.5%, and Hispanic/Latino youths=42.9%. Clerk sex and ethnicity did not affect sales.

DISCUSSION

The standard methodology for assessing youth access to tobacco entails sending youth confederates to purchase cigarettes in randomly selected stores where no one recognizes them. The ensuing data have been interpreted to reflect the access to tobacco of youths outside of compliance studies because of the tacit assumption that such youths behave in a manner similar to that of youth confederates. Perhaps not surprisingly, Study 1 youths indicated they do not behave in the manner that youth confederates do. Instead of attempting to purchase tobacco in randomly selected stores where they are strangers, youths outside of compliance studies, who genuinely desire tobacco, deliberately do

TABLE 1—Stepwise Logistic Regression Predicting Cigarette Sales to Youth from Youth Status Variables and Purchase Protocol

Variables Selected	β	SE	β/SE	OR	95% CI
Step 1: purchase protocol[a]					
Standard Protocol Time 2	.235	.357	.658	1.265	0.629, 2.544
Familiarity Protocol	1.706	.322	5.298	5.506	2.930, 10.346
Standard Protocol Time 3	–.334	.392	–.852	–.716	–0.322, –1.544
Step 2: youth age[b]					
Aged 16 years	1.261	.351	3.593	3.530	1.776, 7.018
Aged 17 years	2.111	.426	4.955	8.254	3.584, 19.006
Step 3: youth ethnicity[c]					
Black	–.134	.401	.334	–.875	0.398, 1.921
Hispanic/Latino	1.657	.389	4.259	5.244	2.448, 11.234

Note. OR = odds ratio; CI = confidence interval; PAs= purchase attempts (N = 915). PAs by age: 15 years = 247 (27%), 16 years = 456 (49.8%), and 17 years = 212 (23.2%). PAs by sex: female = 449 (49.1%) and male = 466 (50.9%). PAs by race/ethnicity: White = 697 (76.2%), Hispanic/Latino = 161 (17.6%), and Black = 57 (6.2%).
[a]Reference group is Standard Protocol Time 1.
[b]Reference group is youth aged 15 years.
[c]Reference group is White youth.

the opposite: they attempt to purchase tobacco in stores in their own neighborhoods where they shop regularly and where they are recognized as good customers to whom clerks therefore "will sell anything."

In Study 2, we used both the standard and the youth-smoker methods to model and compare access within versus access outside of compliance studies, respectively. We found that youths in the Familiarity Protocol were 5.5 times more likely than those in the Standard Protocols to be sold tobacco. Because sales in all 3 Standard Protocols (conducted before and after the Familiarity Protocol) were equally low, the significant increase in sales in the Familiarity Protocol is not an artifact of increasing sales over time; instead, it is the result of the familiarity effect. This effect was achieved by youths who shopped in stores on a mere 4 previous occasions and who consequently were recognized by clerks. The familiarity effect undoubtedly is far larger for youths outside of compliance studies who have shopped in their neighborhood stores for months or years and who not only are recognized by clerks but also know clerks' names and are known to clerks by their names.

This significant difference in sales to familiar versus stranger youths has several implications for both understanding and assessing youth access to tobacco. First, the discrepancy between high tobacco sales to familiar youths and low tobacco sales to stranger youths readily explains the anomalous perceived versus measured access data. Youths continue to perceive and to report that their access to tobacco is high in communities where their measured access is low, because the referent for the former is familiar clerks whereas the referent for the latter is stranger clerks. When asked how easy it is to purchase tobacco, youths no doubt have in mind a specific clerk in a specific store where they shop (rather than a randomly selected clerk in a randomly selected store). Youths' perceptions and reports of high easy access from familiar clerks then are accurate, and researchers' reports of confederate youth strangers' low access are equally accurate, but only the former reflects youths' access to tobacco outside of compliance studies.

Second, the discrepancy between high tobacco sales to familiar youths and low tobacco sales to stranger youths strongly suggests that access to tobacco has decreased and is low for youths in compliance studies, but access to tobacco remains high for youths outside of those studies. This means that what merchants have learned from recent youth-access legislation, enforcement, and interventions is to refuse to sell cigarettes to stranger youths who are likely to be confederates for a compliance study or a police sting operation. That youths seek tobacco from familiar clerks then does not necessarily imply that the problem of youth access resides in the manipulative behavior of youths. Rather, these data suggest that the problem remains the behavior of merchants who avoid prosecution by not selling tobacco to suspicious stranger youths while simultaneously reaping the profits of continued tobacco sales to their regular, familiar youth customers.

Third, if it is indeed the case that youth access to tobacco remains high and stable outside of compliance studies, yet access to tobacco is low and decreasing within those studies, then an additional anomalous finding also is readily explained. Namely, the finding that youth access to tobacco has decreased significantly in the past several years, but smoking among youths has not decreased[5,11,18–20] even though access is a strong—if not the strongest—predictor of smoking among youths.[19,21] Such findings have led many to conclude that decreasing access to tobacco does not decrease smoking among youths[5,18–20] and that youth access programs therefore should be abandoned.[20] An alternative explanation is that access to tobacco has decreased for youth confederate strangers but not for youths outside of compliance studies; hence, smoking among the latter (and the need for youth access programs) largely remains the same.

The discrepancy between high sales to familiar youths and low sales to stranger youths highlights the poor ecological validity of the standard methodology for assessing youth access to tobacco. SAMSHA's prescribed method of sending youths into randomly selected stores where they are strangers must be modified to more accurately reflect youths' and merchants' behavior and hence actual youth access rates. One such modification is to continue to select a random statewide sample of stores but to cease selecting a similarly random sample of youths. Instead, youth confederates may need to be residents of the communities surrounding the target stores who are recognized by clerks as regular purchasers of nontobacco items. Alternatively, youths might be experimentally rendered familiar prior to their tobacco PAs. Likewise, merchant education efforts may need to focus on decreasing tobacco sales to familiar youths who are "good customers" rather than to stranger youths who merchants suspect to be proxies for the police.

Our finding of differential sales by youth age is equally important. Numerous studies have found that tobacco sales are significantly higher to youths aged 16 and 17 years than to youths aged 14 and 15 years.[9,15,16,22] Because SAMSHA's mandated method for assessing youth access to tobacco fails to specify the age of youth confederates, some states employ younger and older cohorts.[23] Consequently, state access rates are difficult to compare, progress toward the nationwide goal of ≤ 20% access remains ambiguous, and some states employ younger cohorts to guarantee artificially low access rates.[23] Hence, the SAMSHA method needs to be revised so that older youth confederates are employed.[16,21] Furthermore, studies indicate that older youths acquire tobacco from commercial sources (i.e., they are the youths who buy it),[10,24–26] whereas younger youths acquire tobacco from social sources (i.e., from older youths and adults who give[10,24–26] or buy[17,27] tobacco for them). Because the youths in access studies must represent those who are likely to purchase tobacco (and, hence, those who are likely be affected by the enforcement of access-to-tobacco policies), older youths clearly are more appropriate confederates. Likewise, because older youths are the primary source of tobacco for younger youths, assessing and decreasing the commercial access of the former is critical to primary prevention.

In summary, the validity of studies of youth assess to tobacco is low, because the assessments use stranger youths whose unfamiliarity decreases their access to tobacco while highlighting their proxy status. The assessments also use young minors whose age further underscores that proxy status. The methodology can be modified to more closely match how youths outside of compliance studies obtain tobacco by employing older youths who are recognized by merchants as regular customers. The need for older confederates has been made clear in numerous studies; however, the need for confederates who are familiar to merchants is based on our study and obviously requires replication. Hence, we encourage interviews with older youth smokers about how (not where) they acquire tobacco from merchants, because we suspect that youths acquire tobacco from clerks whom they know and who are known to all youths in the community as people who "will sell anything." Such findings will further highlight the need to improve the methodology of studies on youth access to tobacco to reflect behavior outside of the studies. ■

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Contributors

H. Landrine and E.A. Klonoff designed the study, analyzed the data and participated equally in writing the article.

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