Community Norms, Enforcement Of Minimum Legal Drinking Age Laws, Personal Beliefs And Underage Drinking: An Explanatory Model

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Abstract

Strategies to enforce underage drinking laws are aimed at reducing youth access to alcohol from commercial and social sources and deterring its possession and use. However, little is known about the processes through which enforcement strategies may affect underage drinking. The purpose of the current study is to present and test a conceptual model that specifies possible direct and indirect relationships among adolescents' perception of community alcohol norms, enforcement of underage drinking laws, personal beliefs (perceived parental disapproval of alcohol use, perceived alcohol availability, perceived drinking by peers, perceived harm and personal disapproval of alcohol use), and their past-30-day alcohol use. This study used data from 17,830 middle and high school students who participated in the 2007 Oregon Health Teens Survey. Structural equations modeling indicated that perceived community disapproval of adolescents' alcohol use was directly and positively related to perceived local police enforcement of underage drinking laws. In addition, adolescents' personal beliefs appeared to mediate the relationship between perceived enforcement of underage drinking laws and past-30-day alcohol use. Enforcement of underage drinking laws appeared to partially mediate the relationship between perceived community disapproval and personal beliefs related to alcohol use. Results of this study suggests that environmental prevention efforts to reduce underage drinking should target adults' attitudes and community norms about underage drinking as well as the beliefs of youth themselves.

Keywords

Underage drinking; Community norms; Enforcement of minimum legal drinking age laws; Personal beliefs; Prevention

Introduction

Despite the national 21-year-old minimum legal drinking age, alcohol continues to be the most commonly used drug among adolescents. Data from the 2007 Monitoring the Future survey show that 16%, 33% and 44% of 8th, 10th, and 12th graders, respectively, reported alcohol use in the past 30 days, while 10%, 22% and 26% reported having five or more drinks in a row in the past two weeks [1]. The estimated annual costs of problems resulting from underage drinking in the U.S are as much as $61.9 billion [2]. Thus, understanding and reducing underage drinking remains a public health priority [3].

The 2007 Monitoring the Future survey also found that 92.2 % of 12th graders, 82.6% of 10th graders, and 62% of 8th graders thought that it was "fairly easy" or "very easy" to get alcohol [1]. Adolescents obtain alcoholic beverages from a wide range of commercial and social sources [4–6]. Various strategies, such as compliance checks, cops-in-shops, and party dispersal programs, to enforce underage drinking laws are aimed at reducing youth access to alcohol from commercial and social sources and deterring its possession and use. Research indicates that there is considerable variability in alcohol policy and enforcement at the community level [7–11]. However, little is known about the processes through which enforcement strategies may affect underage drinking and the interplay between enforcement of local underage drinking laws, community norms and adolescent alcohol use.

In a recent study [12], we were able to show that enforcement of school anti-smoking policy was directly and positively related to perceived community norms about youth smoking. Also, adolescents' personal smoking beliefs appeared to mediate the relationship between perceived enforcement of school anti-smoking policies and past-30-day cigarette smoking. School tobacco policy appeared to partially mediate the relationship between community norms and smoking beliefs. Adopting a similar conceptual model, the purpose of the current study is to describe and provide a preliminary test of possible direct and indirect relationships among adolescents' perception of community alcohol norms, enforcement of underage drinking laws, personal alcohol beliefs, and their past-30-day alcohol use.

The model, which is depicted in Figure 1, is largely grounded in social learning theory [13]. Consistent with the social learning approach, we hypothesize that alcohol use behaviors are largely the result of cognitive processes through which people anticipate the consequences associated with their actions and act accordingly. From this perspective, the most proximal determinants of adolescent alcohol use are their personal beliefs about drinking. These personal beliefs include youths' perceptions of parental disapproval of underage drinking, social and health risks of alcohol use (i.e., perceived personal disapproval and perceived harm of alcohol use), alcohol availability (i.e., the individual's perception of how easy it is to obtain alcohol), and alcohol use by friends. Numerous studies have demonstrated that such beliefs are predictive of adolescents' alcohol use behaviors [14–17].

These personal beliefs about drinking are hypothesized to be directly influenced by local policy and enforcement and by community norms regarding the acceptability of underage drinking. Specifically, the model posits that higher levels of perceived enforcement and perceived community norms that are less accepting of underage drinking will be directly related to personal beliefs that are less supportive of drinking and thereby indirectly to lower levels of drinking by youth. Community norms regarding adolescents' alcohol use are, in turn, hypothesized to be directly and positively related to enforcement of underage drinking policies. That is, the model posits that policy and enforcement efforts reflect broader community norms about the acceptability adolescents' alcohol use. Similarly, community norms about adolescents' alcohol use are assumed to be directly related to adolescents' personal beliefs about underage drinking. Prior studies indicate that community norms about the acceptability of adolescents' alcohol use predict drinking behaviors [18–19]. Using a structural equations modeling approach, the current study will examine the hypothesized relationships among the study variables.

Methods

Study sample and survey procedures

This study is based on secondary analysis of data from 17,830 middle and high school students who participated in the 2007 Oregon Health Teens (OHT) Survey and provided complete data for all study variables (46.1 % males). The OHT survey was implemented in a sample of 275

schools (primarily among 8th and 11th graders) throughout the state of Oregon that were part of statewide random OHT sample, a Centers for Disease Control and Prevention Youth Risk Behavior Survey sample, or schools that wished to participate voluntarily. OHT uses a passive parental consent procedure. The survey is voluntary and the students can refuse to participate at the time of administration. Surveys were administered by teachers or other school staff who were provided with a detailed protocol by OHT contractor. The surveys were given to students in their classrooms and took one class period to complete. Survey forms as well as notification letters were available in English and Spanish. OHT survey data were collected anonymously and institutional review board approval was obtained prior to implementation of the study. The overall OHT response rate was 80.7%.

Measures

The OHT addresses a wide range of health and behavioral issues. OHT items are based on prior survey instruments, including the Youth Risk Behavior Survey [20] and the Washington State Healthy Youth Survey [21].

Past-30-day alcohol use—Responses to four questions were used to measure adolescents' alcohol use in the past 30 days. Participants were asked the number of occasions they had drunk beer, wine (non-religious) or hard liquor in the past 30 days ("0 occasions," "1 to 2 occasions," "3 to 5 occasions," 6 to 9 occasions" and "10 or more occasions"). Participants were also asked about the number of days they had at least one drink of alcohol in the past 30 days and about the number of days they drank alcohol on school property in the past 30 days ("0 days," "1 or 2 days," "3 to 5 days," "6 to 9 days," "10 to 19 days," "20 to 29 days" and "All 30 days"). Additionally, they were asked about the number of days they had five or more drinks of alcohol in a row (i.e., heavy episodic drinking) in the past 30 days ("0 days," "1 day," "2 days," "3 to 5 days," "6 to 9 days," "10 to 19 days" and "20 or more days"). These items were moderately to strongly correlated (rs = .25 to .79) and were used as indicators for a latent variable representing past-30-day alcohol use.

Students' personal drinking beliefs—Personal drinking beliefs included perceived parental disapproval of alcohol use, perceived harm of alcohol use, own disapproval of drinking, perceived alcohol availability, and perceived drinking by peers. To measure perceived parental disapproval students were asked "How wrong do your parents feel it would be for you to drink beer, wine, or liquor (for example, vodka, whiskey, or gin) regularly?" This item was presented on a four-point response scale ranging from "Not wrong at all" to "Very wrong." Perceived harm of alcohol use was measured by asking the students "How much do you think people risk harming themselves (physically or in other ways) if they take one or two drinks of an alcoholic beverage (beer, wine, liquor) nearly every day?" with a four-point response scale from "No risk" to "Great risk." Own disapproval of drinking was assessed by the question, "How wrong do you think it is for someone your age to drink beer, wine, or hard liquor (for example, vodka, whiskey, or gin) regularly?" with a four-point response scale ranging from "Not wrong at all" to "Very wrong." Perceived alcohol availability was measured by asking the adolescents, "If you wanted to get some beer, wine, or hard liquor (for example, vodka, whiskey or gin), how easy would it be for you to get some?" with a four-point response scale ranging from "Very hard" to "Very easy." Finally, to measure perception of alcohol use by peers, students were asked how many of their four best friends had consumed beer, wine, or hard liquor (for example, vodka, whiskey, or gin) during the 12 months preceding the survey, with a five-point response scale from "none" to "four." The correlations between the personal belief items were weak to moderate in strength ($r = -.02$ to .52, see Table 2). In the structural equations analysis, each personal belief item was included as a separate observed variable.

Local police enforcement of underage drinking laws—Two items served as measures for perceived local enforcement: (1) "If someone your age drank some beer, wine or hard liquor in your neighborhood, he or she would be caught by the police" and (2) "If there were a party in your neighborhood where people your age were drinking, the police would come and break it up." Response options were on a four-point scale ranging from "Not at all true" to "Very much true." A moderate correlation was found between these two items ($r = .55$); therefore, the mean of these two variables was computed to represent perceived enforcement of underage drinking laws.

Community disapproval of underage drinking—Community disapproval of adolescents' alcohol use was measured by the question: "How wrong would most adults in your neighborhood, or the area around where you live, think it is for someone your age to drink beer, wine, or hard liquor (for example, vodka, whiskey, or gin) regularly?" with a four-point response scale ranging from "Not wrong at all" to "Very wrong."

Demographics—Students reported their gender, race/ethnicity, and age. Race/ethnicity was dichotomized (white vs. non-white) as the great majority of respondents were white (86.1%).

Data analysis

Structural equations analysis—Latent variable structural equations modeling analyses were used to provide a preliminary test of our conceptual model and to investigate the relationships among community disapproval of underage drinking, perceived local police enforcement of underage drinking laws, adolescents' personal beliefs and adolescents' past-30-day alcohol use, taking into account individual characteristics (i.e., gender, age and ethnicity). Past-30-day alcohol use was a latent variable with four indicators, all the other variables included in the model were single-item observed variables. Initially, a fully-mediated model (Figure 1) was solved. That is, it was assumed that the relations between community norms and past-30-day alcohol use were entirely mediated through perceived enforcement of underage drinking laws and personal drinking beliefs. Similarly, it was assumed that the relation between perceived enforcement of underage drinking laws and past-30-day drinking was mediated through personal drinking beliefs. All structural paths depicted in this conceptual model were included at the first stage of the analyses as were correlations among disturbance terms for belief variables at the same level in the model. Community norms and all of the demographic variables were allowed to freely covary with one another. A specification search using Lagrange Multiplier tests was then undertaken to ascertain if any of the more distal variables were directly related to enforcement of underage drinking laws, drinking beliefs, or past-30-day alcohol use. Such paths were added only if they were consistent with previous research or theory. Wald tests were used to ascertain if there were relations that could be dropped from the model.

The structural equations analyses were conducted using the maximum likelihood estimator in EQS 6.1 [22]. Because the data were not normally distributed, robust estimates of the standard errors and fit statistics were obtained. The ML-based comparative fit index (CFI) and root mean squared error of approximation (RMSEA) were the primary measures used to evaluate model fit [23]. A CFI value ≥.95 and a RMSEA value ≤.06 were considered an indication of a good model fit. Indirect effects were estimated as the products of the relevant paths. Standard errors and significance tests for the indirect effects were obtained with the procedures implemented in EQS using the Sobel approach [24].

Results

Descriptive Statistics

Sample characteristics and correlations among study variables are provided in Table 1 and Table 2. As shown in Table 2, all relationships among study variables are in the expected direction. For example, alcohol availability is positively related to perceived drinking by peers and negatively related to parental and personal disapproval of alcohol use. Community disapproval of adolescents' alcohol use is moderately and positively correlated with enforcement of underage drinking laws and with parental and personal disapproval of alcohol use.

Structural Equations Modeling

Measurement model—Past-30-day alcohol use was represented by a latent variable with four indicators: frequency of past-30-day alcohol use, frequency of past-30-day heavy episodic drinking, number of days used alcohol in the past 30 days, and frequency of past-30-day alcohol use on school property. The unstandardized factor loading for the initial indicator (frequency of alcohol use in the past 30 days) was fixed at 1.0 to identify the model. The standardized factor loadings for the three indicators were .78, .84, .94, and .39 respectively. All of the free factor loadings were statistically significant ($p < .001$).

Structural model—The initial model only marginally fit the data, Satorra-Bentler χ^2 (55, N=17,830) = 2360.37, $p < .001$, Robust CFI = .92, RMSEA = .048 (90% CI=.047, .050). On the basis of the LM tests, and theoretical relevance, paths between some of the background variables and more proximal model variables were added (i.e., paths between gender (male) and past-30-day alcohol use, perceived harm of alcohol use, and perceived drinking by peers; paths between age and perceived alcohol availability, perceived drinking by peers, personal disapproval, perceived parental disapproval of alcohol use and perceived local police enforcement of underage drinking laws). In addition, on the basis of a non-significant Wald test the path between perceived local police enforcement of underage drinking laws and perceived harm of alcohol use was dropped from the model. The fit of the resulting model was significantly improved by these changes, Satorra-Bentler $\Delta\chi^2$ (7, N=17,830) = 1351.97, $p = <.001$. Overall, this model fit the data well, Satorra-Bentler χ^2 (48, N=17,830) = 1008.40, $p < .001$, Robust CFI = .97, RMSEA = .033 (90% CI= 0.32, .035). The final model with standardized coefficients for the primary explanatory variables is shown in Figure 2. Table 3 displays the unstandardized and standardized parameters and associated standard errors and test statistics for all of the paths in the model.

Direct Effects

Past-30-day alcohol use—As indicated in Table 3, past-30-day alcohol use was directly and positively related to perceived alcohol availability and perceived drinking by peers. It was negatively related to perceived parental disapproval of alcohol use, perceived harm of alcohol use, and personal disapproval. Gender was the only background variable directly related to past-30-day alcohol use: being male was significantly and positively related to this outcome.

Drinking beliefs—Expected direct effects on drinking were found from perceived local police enforcement of underage drinking laws to each of the other personal drinking beliefs, except perceived harm of drinking. Direct effects were also found from adolescents' perception of community disapproval to each of the personal drinking beliefs (Table 3). Specifically, community disapproval and perceived enforcement of underage drinking laws were inversely related to perceived alcohol availability and perceived drinking by peers. Conversely, community disapproval and perceived enforcement were positively related to parental disapproval of alcohol use and personal disapproval. Perceived harm of alcohol use was

positively related only to community disapproval. Age was directly and positively related to both perceived alcohol availability and perceived drinking by peers. Age was directly and negatively related to parental disapproval, personal disapproval and perceived enforcement of underage drinking laws. Also, both perceived harm of alcohol use and perceived drinking by peers were inversely related to being male.

Perceived local police enforcement of underage drinking laws—As expected, perceived community disapproval of adolescents' alcohol use was positively related to perceived local police enforcement of underage drinking laws. Age was inversely related to perceived enforcement of underage drinking laws. Other background variables did not directly predict perceived enforcement.

Indirect Effects of Perceived Enforcement and Community Disapproval

The direct effects of perceived enforcement and community norms on drinking behavior were not statistically significant. Both perceived enforcement ($\beta = -.26$, $p < .001$) and perceived community norms ($\beta = -.44$, $p < .001$), however, had large indirect effects on underage drinking. The analyses thus suggest that the relationships between these distal variables and past-30-day alcohol use may be entirely mediated through more proximal drinking beliefs. That is, perceived enforcement of underage drinking laws appeared to decrease perceived alcohol availability and perceived drinking by peers, but to increase perceived parental disapproval and personal disapproval of alcohol use. These beliefs, in turn, were directly related to drinking behaviors. Community norms were similarly related to personal drinking beliefs, including perceived harm, and also to perceptions of increased enforcement.

Discussion

The results of this study are supportive of the proposed explanatory model and contribute to our understanding of how community norms and enforcement of underage drinking laws relate to adolescents' alcohol use. Consistent with social learning theory [13], our findings suggest that personal drinking beliefs may mediate the relationships of community norms about adolescents' alcohol use and local enforcement of underage drinking laws with underage drinking. That is, adolescents who perceived greater community disapproval of drinking and perceived underage drinking laws as more strictly enforced also believed alcohol was less available, less used by their best friends and less acceptable by their parents and themselves. These beliefs, in turn, were directly related to adolescents' past-30-day alcohol use.

Perceived community disapproval of adolescents' alcohol use was directly and strongly related to local enforcement of underage drinking laws. This finding suggests that communities that disapprove underage drinking are more likely to implement and enforce relevant alcohol policies. It might be that variability in alcohol policy and enforcement at the community level [7–11] is due to community norms about adolescents' alcohol use. Community norms were also directly related to all adolescents' personal drinking beliefs, positively with perceived approval by parents, perceived harm, and personal disapproval while negatively with perceived alcohol availability and alcohol use by peers. This pattern suggests that environmental prevention efforts to reduce underage drinking should target adults' attitudes and community norms about underage drinking as well as the beliefs of youth themselves. Further research is needed to understand the interplay between community norms about adolescents' alcohol use, implementation and enforcement of alcohol policies, and the way community norms and enforcement affect adolescents' alcohol use.

Overall, these findings are consistent with our previous results regarding the relationships among community norms, enforcement of school anti-smoking policy, personal smoking beliefs, and youth cigarette smoking [12]. In both studies, adolescents' personal beliefs seemed

to mediate the relationships between community norms and enforcement, on the one hand, and student alcohol and tobacco use on the other. Similar direct relationships were found between community norms and enforcement and between community norms and adolescents' personal beliefs. The replication of our conceptual model for both adolescent tobacco and alcohol use provides greater confidence in it and indicates that the model is generalizable across substances. Therefore, the conceptual model may be useful for understand the use of other drugs and may provide a tool to guide policy makers in the prevention field.

The results of this study should be considered in light of several limitations. The cross-sectional design precludes causal interferences about the relationships that were found. For example, it is possible that alcohol use affects perceptions of enforcement rather than the other way around. That is, students who use alcohol may learn that enforcement of underage drinking laws is low through direct experience (e.g., not being caught and punished when they drink). Conversely, students who do not use alcohol may assume that underage drinking laws are enforced simply because they have no experience violating them. The study also relied on students' perceptions of community norms and enforcement, rather than measuring these factors independently. It is possible that different conclusions would be drawn from objective measures of enforcement activities and community policies and norms. Future studies should, for example, examine the extent to which official reports of local enforcement of alcohol policies are related to students' perceptions and to alcohol use behaviors. Finally, although the results of this study suggest that effects of enforcement of underage drinking laws may be mediated through adolescents' personal beliefs, estimates of mediational effects obtained using cross-sectional data can overestimate the size of such effects [25]. Future studies should examine these relationships across time to allow a better understanding of the relations among local enforcement of underage drinking laws, community norms, and adolescents' alcohol use beliefs and behavior. Despite these limitations, however, this study increases our understanding of the processes through which community norms and local enforcement of underage drinking laws may affect youth alcohol use, and may serve as a basis for future research on the prevention of underage drinking. As such, it is an important contribution and has important implications for prevention of underage drinking and drinking problems through policy approaches.

Acknowledgments

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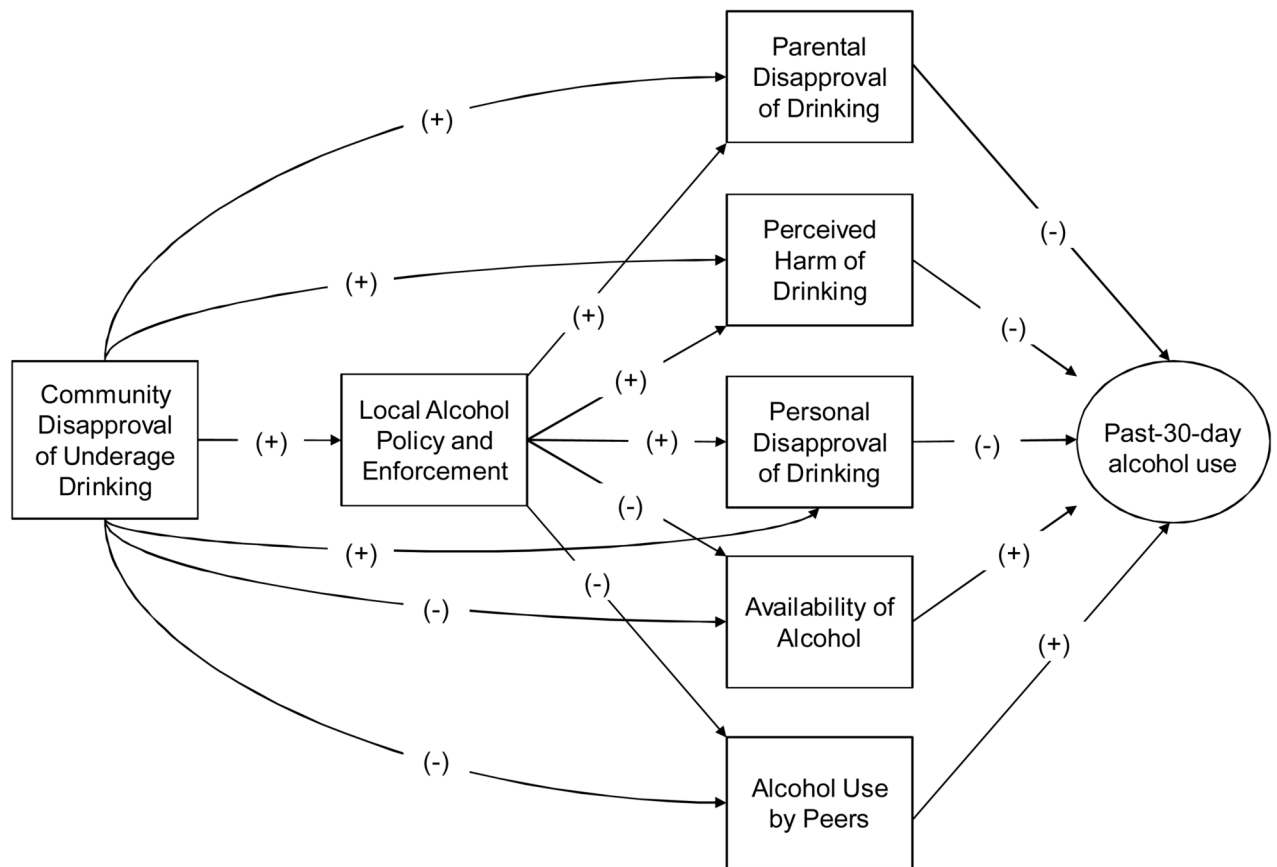
Figure 1.
Conceptual model of community norms, local alcohol policy and enforcement, personal
beliefs, and adolescents' drinking behaviors
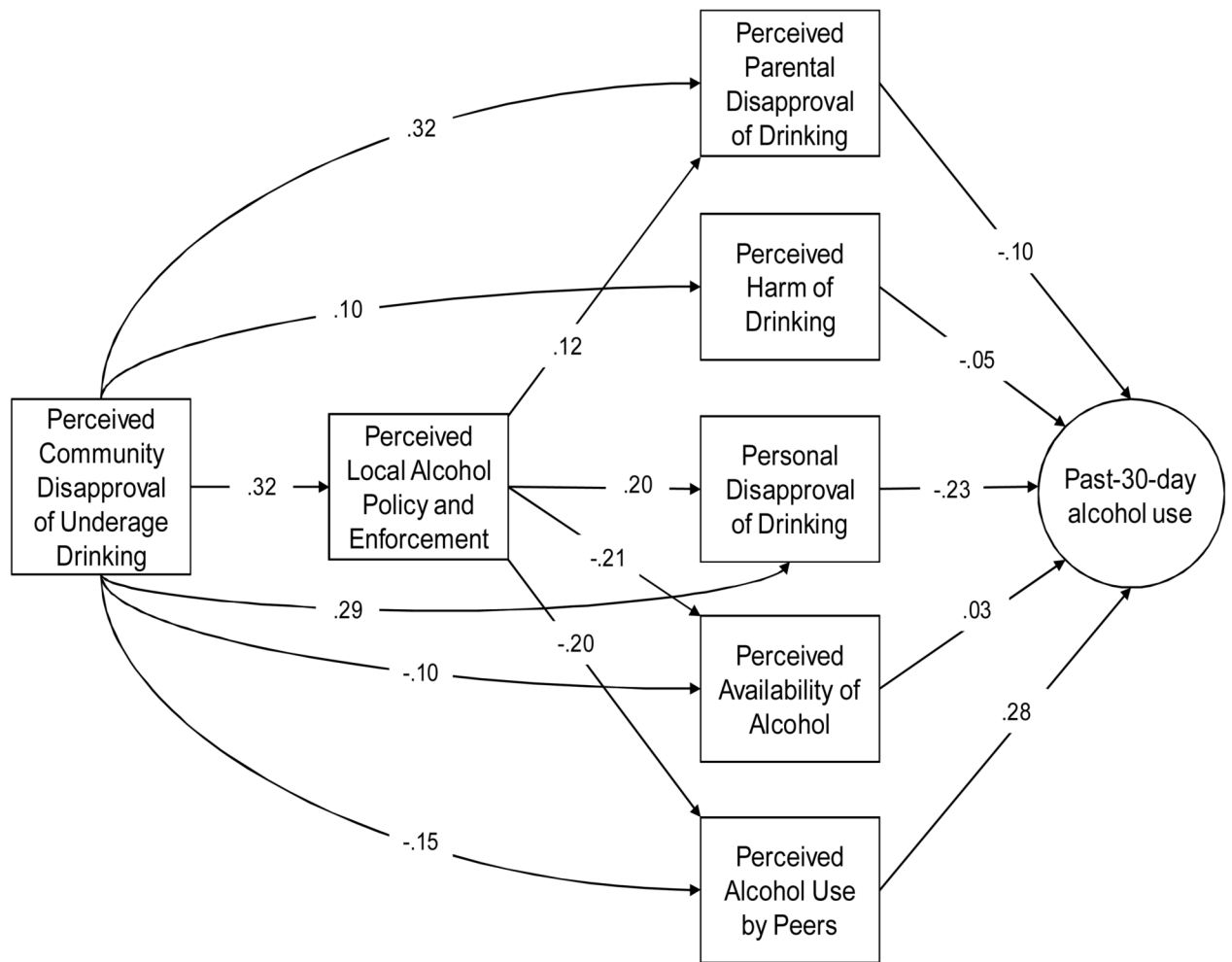
Figure 2.
Standardized results from a structural equations model of community norms, local alcohol policy and enforcement, personal beliefs, and adolescents' drinking behaviors

Table 1

Sample characteristics, percent or mean (SD) (*N*= 17,830)

Variable	% or mean (SD)
Gender (%)	
Male	46.1
Female	53.9
Race/Ethnicity (%)	
White	86.1
Non-white	13.9
Age (%)	
12–14	52.1
15–16	20.3
17–18	27.7
Alcohol-related behaviors	
Frequency of alcohol use, past 30 days	1.33 (2.50)
Frequency of heavy episodic drinking, past 30 days	.58 (1.93)
Number of days used alcohol, past 30 days	1.47 (3.56)
Frequency of alcohol use on school property, past 30 days	.08 (.67)
Personal beliefs	
Perceived parental disapproval of alcohol use	3.45 (.82)
Perceived harm of alcohol use	2.69 (1.10)
Personal disapproval of alcohol use	3.12 (.99)
Perceived alcohol availability	3.02 (1.11)
Perceived drinking by peers	2.28 (1.51)
Perceived local police enforcement of underage drinking laws	2.47 (.90)
Perception of community disapproval of adolescents' alcohol use	3.29 (.83)

Table 2

Correlation matrix among study variables (n=17,830)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Past 30 days alcohol use	*	.64*	.73*	.25*	-.33*	-.11*	-.47*	.26*	.45*	-.18*	-.21*
2. Past 30 days binge drinking		*	.79*	.36*	-.23*	-.09*	-.34*	.16*	.34*	-.14*	-.16*
3. Past 30 days number of days used alcohol			*	.37*	-.30*	-.11*	-.40*	.22*	.40*	-.16*	-.19*
4. Past 30 days alcohol use on school property				*	-.08*	-.06*	-.12*	.05*	.10*	-.04*	-.07*
5. Parental disapproval of alcohol use					*	.14*	.52*	-.27*	-.31*	.25*	.38*
6. Perceived harm of alcohol use						*	.19*	-.11*	-.02*	.04*	.10*
7. Personal disapproval of alcohol use							*	-.35*	-.52*	.34*	.39*
8. Perceived alcohol availability								*	.34*	-.28*	-.20*
9. Perceived drinking by peers									*	-.30*	-.26*
10. Enforcement of underage drinking laws										*	.35*
11. Community disapproval											*

*
$p<.01$

Table 3

Results from the final structural model to describe relationship between community disapproval of adolescents' alcohol use, perceived enforcement of underage drinking laws, personal beliefs and past-30-day alcohol use

Dependent variables	Standardized coefficient	Unstandardized coefficient	S.E	t
Predictors				
Past 30-day alcohol use				
Perceived parental disapproval of Alcohol use	−.10	−.24	.03	−8.92*
Perceived harm of alcohol use	−.05	−.09	.01	−7.46*
Personal disapproval of alcohol use	−.23	−.45	.02	−19.79*
Perceived alcohol availability	.03	.04	.01	4.59*
Perceived drinking by peers	.28	.36	.01	26.77*
Male (R²= .27)	.02	.10	.03	3.55*
Perceived parental disapproval of alcohol use				
Perceived enforcement of underage drinking laws	.12	.11	.01	16.45*
Perception of community disapproval	.32	.32	.01	36.67*
Age (R²=.17)	−.08	−.04	.01	−10.75*
Perceived harm of alcohol use				
Perception of community disapproval	.10	.13	.01	13.00*
Male (R²=.02)	−.10	−.23	.02	−14.25*
Personal disapproval of alcohol use				
Perceived enforcement of underage drinking laws	.20	.22	.01	28.01*
Perception of community disapproval	.29	.34	.01	35.83*
Age (R²=.22)	−.17	−.11	.01	−23.89*
Perceived alcohol availability				
Perceived enforcement of underage drinking laws	−.21	−.26	.01	−26.53*
Perception of community disapproval	−.10	−.13	.01	−13.84*
Age (R²=.12)	.18	.13	.01	25.27*
Perceived drinking by peers				
Perceived enforcement of underage drinking laws	−.20	−.33	.01	−26.76*
Perception of community disapproval	−.15	−.27	.01	−18.57*
Male	−.07	−.22	.02	−11.80*
Age (R²=.17)	.24	.24	.01	33.29*
Perceived enforcement of underage drinking laws				
Perception of community disapproval	.32	.35	.01	45.86*
Age (R²=.14)	−.15	−.09	.01	−20.86*

Note. Model fit: CFI=.97; RMSEA=.033 (90% CI = .032, .035).

*
 $p< .001$