



Published in final edited form as:

J Community Psychol. 2013 May ; 41(4): 463–470. doi:10.1002/jcop.21550.

The Carrot and the Stick: A Cross-Sectional Study of the Influences on Responsible Merchant Practices to Reduce Underage Drinking

Patricia Ebener, BA¹, Patrick Malone, Ph.D.², Pamela Imm, Ph.D.², Karen Chan Osilla, Ph.D.¹, Susan M. Paddock, Ph.D.¹, Patricia Ann Wright, Ph.D.², and Q Burkhardt, MA¹

¹RAND Corporation, 1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

²University of South Carolina, Barnwell College, Department of Psychology, Columbia, SC 29208

Abstract

Alcohol merchants (N=331) completed a cross-sectional survey assessing their attitudes and beliefs about underage drinking, its likely consequences, requirements for responsible beverage service (RBS) training, and performance of RBS practices and checking IDs. Merchants requiring more rigorous RBS training (i.e., state-approved versus in-house or none) have stronger beliefs that outlets who sell to minors will get cited and that their employees know RBS practices. Also, merchants who engage in more RBS practices require more rigorous RBS training, and believe more strongly that outlets who sell to minors are more likely to face, and deserve, stricter sanctions. Merchants who check IDs more strictly conduct more RBS practices and believe more strongly that underage drinking is serious and will result in stronger consequences if caught selling to minors. These findings about the attitudes, practices, and enforcement of alcohol merchants suggests ways communities can better target their limited resources to prevent underage drinking.

Keywords

alcohol merchants; prevention; responsible beverage service

Underage drinking is a significant problem, costing the U.S. about \$53 billion annually (Institute of Medicine, 2004). Forty-one percent of U.S. high school seniors report drinking in the last 30 days and 23 percent report drinking five drinks or more at a time in the past two weeks (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Annually, about 5,000 minors die from alcohol related injuries (CDC, 2004). Given that about 30% of youth access alcohol through commercial sources (Paschall et al., 2007), a common prevention strategy is responsible beverage service (RBS) training, which teaches managers and servers how to refuse minors and intoxicated adults. Some studies on RBS training show positive results on ID checking, BACs, and traffic crashes, while others do not (Guide to Community Preventive Services, 2011). Merchant compliance has been cited as a reason for inconclusive evidence (Ker & Chinnock, 2008). However, few studies have assessed the mediators of

compliance such as merchant attitudes. One study (Turrisi, Nicholson, & Jaccard, 1999) did find merchants' perceptions were linked to preventing excessive intoxication, but not underage drinking. Other little-studied RBS practices—i.e. those that help merchants refuse sales—include age verification devices, written policies that employees sign, employee incentives for refusing minors, and signs saying the outlet checks IDs. Consistent with the theory of planned behavior (individuals' attitudes predict behavior, Ajzen & Fishbein, 1977), improving our limited understanding of merchant attitudes could inform prevention efforts to use those attitudes to influence merchants to obey sales laws through “carrots” (rewarding merchants' beliefs that underage drinking is a problem) and/or “sticks” (reinforcing merchants' fear of negative consequences if caught selling to minors).

The present study assesses the relationship between merchant RBS attitudes, practices and enforcement of alcohol sales laws through a survey of managers and owners of 331 alcohol outlets in South Carolina. We hypothesized that (1) merchants with more anti-underage drinking/pro-enforcement attitudes would require and engage in more and better RBS training, RBS practices, and enforcement of alcohol laws (i.e., check IDs more stringently); (2) merchants who require RBS training would engage in more RBS practices, and (3) both RBS training and practices would mediate the relationship between merchant attitudes and enforcement.

METHODS

Study Sample

The study's sample were alcohol outlets from six South Carolina counties whose alcohol and drug abuse authorities received state funding for underage drinking prevention. The six counties have mixed socioeconomic profiles, with the more urban counties representing slightly higher socioeconomic status, based on median household income (U.S. Census, 2012). The population density of the counties varied, from 41.7 persons per square mile to 481 persons per square mile (SCIWAY, 2012). Race also varied by county. Statewide in 2000, about two thirds were White and 30% were African American. The most heterogeneous county in this study is about half White and 45% African American, while the most homogeneous county is 84% White and 13% African American (SC Budget and Control Board, 2011).

Data Collection and Sample Description

Our universe was 2,147 outlets licensed to sell alcohol “off” (must leave to consume)- and “on” (can consume where purchased)-premises in the six counties. Stratifying by county and off/on-premises status, we randomly sampled 675 outlets based on power estimates for a larger evaluation of an underage drinking intervention. From September to December 2008 (before the intervention), merchants were surveyed by phone by four experienced interviewers using a standardized protocol. Of the 675, 49 (7.26%) refused; 129 (19.11%) were ineligible because they were out of business, not alcohol sales outlets, were duplicates, or were not exclusively an on or off-premises outlet; and 162 (24.0%) were incomplete. Omitting ineligibles yielded a completion rate of 61% (n=331, 188 off- and 143 on-premises). About 57% of merchants were male; 63% were White, 13% Black, and 24%

other races/ethnicities. The average age was 41.34 years ($SD=13.24$). About 3% had less than a high school education, 33% were high school graduates, 27% had vocational training or some college, and 37% had at least a college degree. Merchants had owned or worked for their outlet for an average of 7.59 years ($SD=8.51$). About 28% of respondents were owners, 54% were head managers, and 17% were assistant managers.

Measures

The merchant survey included items from previous underage drinking studies and new items developed based on practices recommended to minimize the sale of alcohol to minors (see Chinman et al., 2011 for details). We created scales on merchants' attitudes, requirement of RBS training, RBS practices, and enforcement of sales laws. A principal components analysis (eigenvalues >1.0 , Varimax rotation) reduced 16 attitude items to the following factors:

- **SERIOUSNESS:** Alcohol-related accidents/Underage drinking are a serious problem; 1=strongly disagree to 5=strongly agree, range= 2–10, $\alpha=.65$, factor scores = .83–.85
- **FAVOR SANCTIONS:** Favor fining/revoking licenses; 1=oppose to 5=favor, range= 2–10, $\alpha=.68$, factor scores = .84–.89
- **ALCOHOL ACCESS:** How difficult is it for a minor to buy alcohol at a grocery/liquor store/bar or restaurant/using a 21 year old; 1=not at all difficult to 7=very difficult, range=4–28, $\alpha=.61$, factor scores = .43–.79
- **LIKELY CONSEQUENCE:** Most likely consequence an outlet would receive for a 1st selling offense; 1–5, higher is stronger consequence
- **CITED:** Likelihood of being cited for selling to a minor; 1=Not at all to 7=Extremely likely
- **GET CREDIT:** Merchants get credit for refusing minors; 1=Strongly disagree to 5=Strongly agree
- **KNOW RBS:** Employees know RBS practices; 1=Strongly disagree to 5=Strongly agree

The second category collapsed multiple items into a single, three-level RBS TRAINING variable: state-approved training required for all employees, in-house training required for all employees or a mix of training types, or no training required. The third category was an RBS Practice Index that summed six items (Yes/No) assessing the presence of an age verification device, written policy for employees, an incident log, signs stating IDs are checked, employees incentives to refuse minors, and “anything else” a merchant could do. These practices were chosen because they were recommended in the literature and are the most prevalent in the state. The fourth category was one item assessing circumstances when merchants require age identification (CHECK IDS: always, purchaser appears under 35, or options less strict).

The analyses are adjusted for the number of outlets within 500 meters of each responding outlet (i.e., “density”), which is purported to impact sales practices through increased

competition and lax norms that may arise within clusters of alcohol outlets (Truong & Sturm, 2009). We used Microsoft's online Terra Server database and Google Maps API Geocoding service (Google code, 2012) to geocode merchants (see Chinman et al., 2011).

Analyses

Including merchant characteristics and outlet density as covariates, we first estimated a saturated path model with all relations in sequence, with RBS attitudes predicting RBS TRAINING, RBS PRACTICE INDEX, and CHECK IDS; RBS TRAINING predicting RBS PRACTICE INDEX; and both practices predicting CHECK IDS. We used results of this model to test for indirect effects of the attitude measures on enforcement via the hypothesized practice mediators and of RBS TRAINING on enforcement via RBS PRACTICE INDEX. All analyses were conducted using the latent variable program *Mplus* v.6.1 (Muthén & Muthén, 2010), adjusting for data missing at random (Little & Rubin, 1987) and for clustering (outlets within counties). Since *Mplus* does not include estimates from bootstraps for a clustered design, we used delta method standard errors for combinations of coefficients (Bollen, 1987). A second set of analyses assessed whether the observed relations varied by on- or off-premises outlet type.

RESULTS

Descriptive Statistics

Correlations between the attitudes, RBS TRAINING, RBS PRACTICE INDEX, and CHECK IDS were generally modest, regardless of partialling. Correlations involving RBS TRAINING and CHECK IDS were attenuated because they are ordinal, for which we compensated in the modeling. Overall, the merchants did not believe very much that they would get credit for refusing minors ($M=1.01$, $SD=.81$). They had moderate certainty merchants would be cited for selling to minors ($M=4.81$, $SD=1.97$) and face strict consequences for a 1st selling offense ($M=3.76$, $SD=.92$). They considered underage drinking a serious problem ($M=7.70$, $SD=2.31$); favored strict sanctions for selling to minors ($M=7.35$, $SD=2.73$); believed minors have difficulty purchasing alcohol ($M=21.54$, $SD=5.06$), and believed their employees know RBS ($M=4.57$, $SD=.81$). Merchants reported using, on average, three RBS practices ($SD=1.44$). About a third requires some RBS training and 29% report always checking IDs.

Saturated Path Model

Each variable was modeled with a directional relationship to all variables downstream of it (Table 1). All variables at a given tier were modeled with free relations among the disturbance terms. All significant effects were in the anticipated direction (Figure 1). Two of the seven attitudinal measures (CITED and KNOW RBS) contributed significant unique prediction to RBS TRAINING, and three (LIKELY CONSEQUENCE, FAVOR SANCTIONS, and KNOW RBS) contributed significant unique prediction to the RBS PRACTICE INDEX, as did RBS TRAINING. The RBS PRACTICE INDEX, but not RBS TRAINING, was a significant predictor of CHECK IDS. LIKELY CONSEQUENCE and SERIOUSNESS also showed significant direct effects on CHECK IDS.

Next, we tested effects of the hypothesized mediators (Table 2). We first tested the total indirect effect (i.e., via RBS TRAINING, RBS PRACTICE INDEX, or the path through both) of each attitude, as well as across all attitudes, on CHECK IDS, applying the Holm-Bonferroni correction for multiple tests (Holm, 1979). There were significant overall indirect effects of SERIOUSNESS, ALCOHOL ACCESS, CITED, and KNOW RBS via the mediators, as well as of the set of attitudes. Decomposing these effects indicated no significant specific indirect effects via either the full path or single mediators, suggesting that the overall indirect effects operated through multiple paths. Finally, as hypothesized, there was an effect of RBS TRAINING on CHECK IDS that was significantly mediated by the RBS PRACTICE INDEX. Outlet type (on/off) did not moderate path coefficients in the full model, $\chi^2(24, N = 324) = 27.5, p = .281$.

DISCUSSION

A self-report survey of alcohol merchants in South Carolina suggest merchants could improve in requiring more rigorous RBS training, engaging in more RBS practices, and checking IDs more regularly. Also, we found that merchants who require more rigorous RBS training of their employees (i.e., state-approved versus in-house or none) more believe merchants would get cited for selling to minors and that their employees know RBS practices. Also, merchants who engage in more RBS practices require more rigorous RBS training of their employees, and believe more that outlets who sell to minors will get cited, face tougher consequences when they do get cited, and should face stricter sanctions. Merchants who check IDs more strictly conduct more RBS practices as well as believe more strongly that underage drinking is serious and that they would face stronger consequences if caught selling to minors. This study suggests that implementing a state-approved RBS training program over an “in-house” (or no) training may help merchants with enforcement (i.e., strictly checking IDs).

Further analyses suggest that RBS training and RBS practices have mediational roles between attitudes and enforcement. Although causality cannot be determined, the results suggest that stronger attitudes (i.e., underage drinking is serious; selling to minors has consequences) may lead to greater participation in more rigorous RBS training and other RBS practices (consistent with Turrisi, et al., 1999), which may lead to stronger enforcement, as hypothesized.

The implications of these findings are that targeting merchants' attitudes could be a successful strategy to change their behavior. For example, through meetings with merchants, RBS training, and use of media, communities could highlight local tragic consequences of underage drinking (carrot) and that merchants who sell to minors will be caught and cited (stick). Merchants could be influenced by carrying out compliance checks and enforcing consequences (stick) and publically communicating positive results of those checks (carrot). These findings also suggest that RBS practices such as training, age verification devices, signage, written policies/procedures for employees, and incident logs could improve enforcement. Getting input from merchants could help communities better encourage adoption of these RBS practices.

This study has certain limitations. The findings' generalizability may be limited because the sample is from one state; non-respondents may have differed from respondents; the new RBS practice items have unknown psychometric properties; the models used were correlational; and the data were all self-reported. Prospectively assessing merchant attitudes, RBS training, RBS practices, and using compliance checks to validate enforcement, would be useful. Despite these limitations, this study identified specific relationships between merchants' attitudes, training, sales practices and enforcement that communities can use to improve their prevention efforts.

Acknowledgments

We are grateful to all the merchants who completed this survey. This paper was supported by: Centers for Disease Control and Prevention: Getting to Outcomes and Underage Drinking. 1R18CE001335-01.

References

- Ajzen I, Fishbein M. Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*. 1977; 84:888–918.
- Bollen, KA. Total, Direct, and Indirect Effects in Structural Equation Models. In: Clogg, C., editor. *Sociological Methodology*, 1987. Washington, DC: American Sociological Association; 1987. p. 37-69.
- Centers for Disease Control and Prevention (CDC). WebBased Injury Statistics Query and Reporting System (WISQARS). Atlanta, GA: CDC; 2004.
- Chinman M, Burkhardt Q, Ebener P, Fan CC, Imm P, Osilla KC, Paddock SM, Wright A. The premises is the premise: understanding off- and on-premises alcohol sales outlets to improve environmental alcohol prevention strategies. *Prevention Science*. 2011; 12(2):181–191. [PubMed: 21373877]
- Truong KD, Sturm R. Alcohol environments and disparities in exposure associated with adolescent drinking in California. *American Journal of Public Health*. 2009; 99:264–270. [PubMed: 19059870]
- Google code. Google Maps API Web Services. 2012. Retrieved 2/24/2012 from <http://code.google.com/apis/maps/documentation/geocoding/index.html>, Archived by WebCite® at <http://www.webcitation.org/65hPtB2Ze>
- Guide to Community Preventive Services. Preventing excessive alcohol consumption: responsible beverage service training. 2011. Retrieved 2/16/2012, from www.thecommunityguide.org/alcohol/beverage_service.html, Archived by WebCite® at <http://www.webcitation.org/65kElf4N8>
- Institute of Medicine. Reducing underage drinking: a collective responsibility. Washington DC: The National Academies Press; 2004.
- Johnston, LD., O'Malley, PM., Bachman, JG., Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975–2010. Ann Arbor: Institute for Social Research, University of Michigan; 2011. p. 744 Volume I: Secondary school students
- Ker K, Chinnock P. Interventions in the alcohol server setting for preventing injuries. *Cochrane Database of Systematic Reviews*. 2008; (3) Art. No.: CD005244.
- Little, RJ., Rubin, DB. *Statistical analysis with missing data*. New York: Wiley; 1987.
- Muthén, LK., Muthén, BO. *Mplus User's Guide*. Sixth. Los Angeles, CA: Muthén & Muthén; 2010.
- Paschall MJ, Grube JW, Black C, Flewelling RL, Ringwalt CL, Biglan A. Alcohol outlet characteristics and alcohol sales to youth: results of alcohol purchase surveys in 45 Oregon communities. *Prevention Science*. 2007; 8(2):153–159. [PubMed: 17243019]
- Budget, SC., Board, Control. South Carolina Community Profiles. 2011. Retrieved 2/20/2012 from www.sccommunityprofiles.org, Archived at www.webcitation.org/65kE8Ko6L
- SCIWAY. South Carolina's Information Highway. 2012. Retrieved 2/20/2012 from <http://www.sciway.net/>, Archived by WebCite® at www.webcitation.org/65kEBdG4H
- Turrisi R, Nicholson B, Jaccard J. A cognitive analysis of server intervention policies: Perceptions of bar owners and servers. *Journal of Studies on Alcohol*. 1999; 60(1):37–46. [PubMed: 10096307]

U.S. Census. State & County QuickFacts. 2012. Retrieved 2/20/2012 from <http://quickfacts.census.gov>, Archived by WebCite® at www.webcitation.org/65kE0oAeU

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

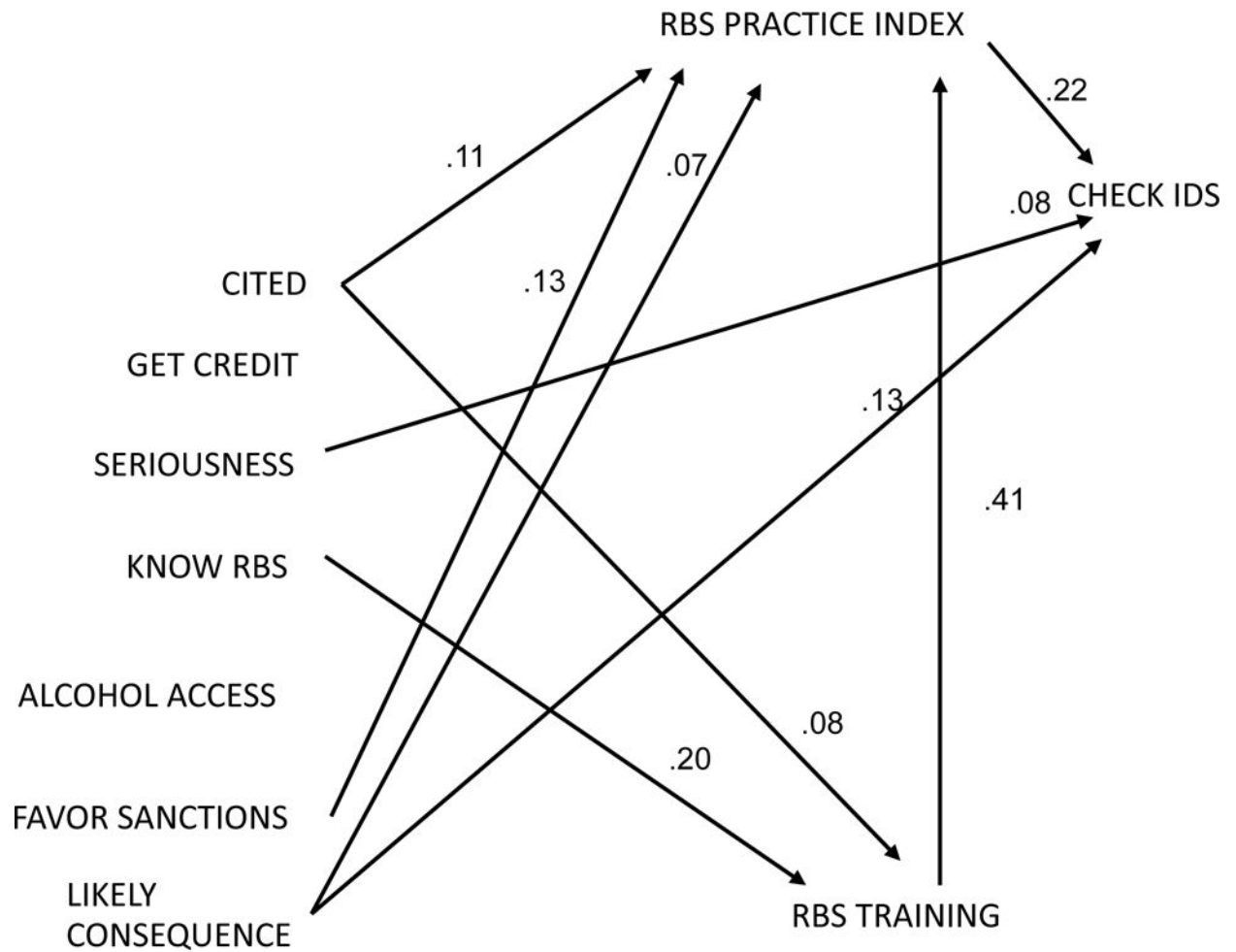


Figure 1. Significant standardized path coefficients

- RBS TRAINING= formal or state-approved training for all employees= 3, in-house training for all employees or a mix of training types/=2, no training which was required of all employees=1
- RBS PRACTICE INDEX = age verification device + written policy + incident log + signs posted + incentives for employees who detect minors trying to buy + does “anything else” to prevent selling to minors
- CHECK IDS = always=3, when the purchaser appears to be under 35=2, or options less strict=1

Table 1

Path model results.

Attitudes	RBS practices						Enforcement		
	RBS TRAINING			RBS PRACTICE INDEX			CHECK IDS		
	Unstandardized path coefficients	SE	p	Unstandardized path coefficients	SE	p	Unstandardized path coefficients	SE	p
LIKELY CONSEQUENCE	-0.048	.136	.725	0.105	.050	.034	0.158	.055	.004
SERIOUSNESS	0.034	.047	.465	0.049	.035	.165	0.038	.015	.012
FAVOR SANCTIONS	0.005	.019	.783	0.069	.033	.034	-0.007	.011	.540
ALCOHOL ACCESS	0.015	.009	.071	0.007	.010	.458	0.001	.016	.928
CITED	0.043	.016	.009	0.082	.041	.045	0.001	.036	.972
GET CREDIT	0.000	.035	.990	0.023	.092	.800	0.067	.065	.306
KNOW RBS	0.257	.099	.010	0.070	.123	.568	0.097	.062	.117
RBS TRAINING				0.570	.121	<.001	0.053	.092	.566
RBS PRACTICE							0.167	.043	<.001

N = 321. Bold coefficients are at $p < .05$. All coefficients are adjusted for proprietor race/ethnicity, sex, and age and local outlet density. Upstream variables in columns predict downstream variables in rows.

Table 2

Tests of Indirect Effects on CHECK IDS

Predictor	Mediator	Estimate	SE	t	P	Alpha
Total attitudinal set	Total Indirect	0.114	0.035	3.27	.001	.006
	Via Path	0.029	0.016	1.86	.063	.050
	Via RBS PRACTICE	0.068	0.041	1.65	.098	.050
	Via RBS TRAINING	0.016	0.029	<1	Ns	-
LIKELY CONSEQUENCE	Total Indirect	0.011	0.011	<1	Ns	-
	Total Indirect	0.013	0.004	3.02	.002	.007
SERIOUSNESS	Via Path	0.003	0.005	<1	Ns	-
	Via RBS PRACTICE	0.008	0.005	1.80	.071	.050
FAVOR SANCTIONS	Via RBS TRAINING	0.002	0.003	<1	Ns	-
	Total Indirect	0.012	0.006	1.96	.050	.017
ALCOHOL ACCESS	Total Indirect	0.004	0.001	2.91	.004	.010
	Via Path	0.001	0.001	1.25	.211	.050
CITED	Via RBS PRACTICE	0.001	0.001	<1	Ns	-
	Via RBS TRAINING	0.001	0.001	<1	Ns	-
	Total Indirect	0.020	0.008	2.61	.009	.012
	Via Path	0.004	0.003	1.46	.144	.050
KNOW RBS	Via RBS PRACTICE	0.014	0.008	1.82	.069	.050
	Via RBS TRAINING	0.002	0.004	<1	Ns	-
GET CREDIT	Total Indirect	0.050	0.017	2.93	.003	.008
	Via Path	0.025	0.017	1.48	.138	.050
	Via RBS PRACTICE	0.012	0.021	<1	Ns	-
RBS TRAINING	Via RBS TRAINING	0.014	0.019	<1	Ns	-
	Total Indirect	0.004	0.014	<1	Ns	-
RBS PRACTICE	RBS PRACTICE	0.095	0.035	2.70	.007	.050

N = 324. Tabled values are unstandardized point estimates of indirect effects, associated delta-method standard errors, and test statistics. Tests of total indirect effects used the Holm-Bonferroni correction for multiple contrasts, with the adjusted alpha shown in the last column; ‘—’ indicates that significance was not evaluated per the correction method. Bold coefficients are statistically significant (after correction) at a nominal $p < .05$.