Evaluation of an Australian alcohol media literacy program

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Abstract

Objective: A 10-lesson alcohol media literacy program was developed, underpinned by the message interpretation processing model, inoculation theory, and constructivist learning theory, and was tailored to be culturally relevant to the Australian context. This program aimed to increase students' media deconstruction skills and reduce intent to drink alcohol. The purpose of this study was to evaluate the effectiveness of the program in achieving these goals through a short-term quasi-experimental trial. Method: Elementary schools were assigned to either the intervention group (83 students) or a wait-list control group (82 students). Student questionnaires were administered at three time points (baseline, after the intervention group completed the program, and after the wait-list control group completed the program) to evaluate the effectiveness of the intervention. Results: The intervention and wait-list control groups reported significantly higher media deconstruction skills as a result of the intervention. Both groups reported significantly lower social norms, whereas the wait-list control group reported significantly lower positive alcohol expectancies. There were no significant changes to self-efficacy to refuse alcohol, preference for alcohol-branded merchandise, and understanding of persuasive intent as a result of the intervention. Conclusions: To date, the majority of alcohol media literacy studies have been conducted in the United States and have focused on deconstructing television and print-based ads. This evaluation provides evidence that an alcohol media literacy program that was developed for a specific cultural context, and that incorporates a broad range of multimodal advertisements, can have a positive impact on beliefs and attitudes that are known predictors/precursors of drinking behaviors.

Evaluation of an Australian Alcohol Media Literacy Program

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ABSTRACT. **Objective:** A 10-lesson alcohol media literacy program was developed, underpinned by the message interpretation processing model, inoculation theory, and constructivist learning theory, and was tailored to be culturally relevant to the Australian context. This program aimed to increase students' media deconstruction skills and reduce intent to drink alcohol. The purpose of this study was to evaluate the effectiveness of the program in achieving these goals through a short-term quasi-experimental trial. **Method:** Elementary schools were assigned to either the intervention group (83 students) or a wait-list control group (82 students). Student questionnaires were administered at three time points (baseline, after the intervention group completed the program, and after the wait-list control group completed the program) to evaluate the effectiveness of the intervention. **Results:** The intervention and wait-list control groups reported significantly higher media deconstruction skills as a result of the intervention. Both groups reported significantly lower social norms, whereas the wait-list control group reported significantly lower positive alcohol expectancies. There were no significant changes to self-efficacy to refuse alcohol, preference for alcohol-branded merchandise, and understanding of persuasive intent as a result of the intervention. **Conclusions:** To date, the majority of alcohol media literacy studies have been conducted in the United States and have focused on deconstructing television and print-based ads. This evaluation provides evidence that an alcohol media literacy program that was developed for a specific cultural context, and that incorporates a broad range of multimodal advertisements, can have a positive impact on beliefs and attitudes that are known predictors/precursors of drinking behaviors. (*J. Stud. Alcohol Drugs, 77,* 950–957, 2016)

ALCOHOL MISUSE HAS SIGNIFICANT HEALTH, social, and economic consequences for individuals and society (World Health Organization, 2014). Children and adolescents are particularly at risk for alcohol-related harm compared with other age groups (Mäkelä & Mustonen, 2000) because their brains are still undergoing critical development (Bava & Tapert, 2010; Hickie, 2010). Alcohol media literacy programs in schools provide a viable approach to alcohol prevention (Gordon et al., 2015) because they can equip students with skills to mitigate potentially harmful media messages about alcohol (Grenard et al., 2013). *Media literacy* is defined as the ability to access, analyze, evaluate, and communicate messages in various forms (Thoman & Jolls, 2005). A systematic review of alcohol media literacy programs indicated positive effects on a number of outcomes, including an increase in media deconstruction skills and understanding of persuasive intent, a decreased interest in alcohol-branded products (a precursor to drinking), and lowered social norms for teen drinking (Gordon et al., 2015).

The review also noted that the majority of the interventions have been developed, implemented, and evaluated in the United States, and they are therefore culturally relevant to that region. Alcohol media literacy programs are unlikely to be successful when implemented in different cultural contexts such as the United Kingdom and Australia because of differences in regulation standards, cultural nuances, and the nature of alcohol advertising (Distilled Spirits Council, 2011; International Centre for Alcohol Policies, 2001), all of which can influence the relevance and effectiveness of the program (Davis & Rankin, 2006). As an example, although it is appropriate to include tobacco advertisements in a U.S.-based program (Kupersmidt et al., 2010, 2012), this otherwise nonexistent exposure would be unethical in an Australian context, where tobacco advertising is banned in all forms. Furthermore, the programs published to date focus on television and print-based ads. Children need skills to respond to the broad range of multimodal advertisements to which they are exposed, including online (e.g., YouTube and banner advertising), environmental (e.g., advertisements on outdoor billboards and sports fields), and traditional forms such as television and print (Gordon et al., 2015).

In response to these gaps in prevention programs and findings from the systematic literature review (Gordon et al., 2015), an alcohol media literacy program for Australian children was developed (Gordon et al., 2016). Key knowledge and skills taught included understanding the persuasive purpose of advertising and the techniques used to sell products, deconstructing multimodal advertisements, questioning and challenging media messages, and creating sophisticated visual and digital texts. The program linked to the Australian curricula (English/Language Arts and Personal Development and Health, Physical Education [PDHPE]) incorporated

Australian advertisements and brands and explored the connection between alcohol and Australian sports culture.

The upper-elementary school age group was chosen to "inoculate" (Banas & Rains, 2010) students against pro-alcohol messages before they engage in drinking behaviors, as delaying initiation to drinking can reduce the risk of future alcohol-related harm (Jackson et al., 2015; McMorris et al., 2011). Furthermore, pre-adolescence is a crucial period when alcohol expectancies begin to form, and children are emotionally vulnerable to the persuasive appeals of advertising (Miller et al., 1990; Scull et al., 2014). The principles of the message interpretation processing (MIP) model (Austin, 2007) were incorporated in the program by teaching students to challenge the emotional messages that are presented in advertising through strengthening their logical reasoning. For example, students explored and discussed the "hidden messages" that are often presented in advertisements, such as that drinking alcohol will make a person attractive or popular. The facilitator explained how such messages may appeal to emotional reasoning, and the students were encouraged to use their logical reasoning to evaluate the truthfulness of the messages presented. The students gained practice in countering these messages with facts they had learned about alcohol, such as that drinking too much alcohol could result in a fight, which would not make a person popular.

Constructivist teaching principles were used through the inclusion of hands-on learning experiences that drew on students' prior learning (Grace & Henward, 2013) and connected with authentic text to encourage action. For example, in the final learning experience, the students applied the skills and knowledge learned to create a counter-advertisement that presented truths about alcohol that were absent from the original advertisements. The task used genuine alcohol advertisements that were familiar to the students. Preliminary findings from a pilot study indicated that the program had potential to lead to measurable outcomes (Gordon et al., 2016).

Method

Design

A quasi-experiment was conducted to evaluate the effectiveness of the media literacy program. More specifically, a crossover design was used, whereby an intervention group (pre-existing classes) received the intervention over a 3-month period, after which a wait-list control group received the intervention. The intervention group received the program between Wave 1 and Wave 2, whereas the wait-list control group completed regular course work during this period. The wait-list control group received the program between Wave 2 and Wave 3, and the intervention group completed regular course work during that period. This crossover design was adopted to ensure (a) equity and motivation for

the members of the control group, who would ultimately receive the intervention, and (b) evaluation of intervention efficacy in a second cohort (Hills & Armitage, 1979). However, this design does not ensure parallel data structure at Wave 3, at which point both groups have received the intervention. As such, only a priori planned post hoc analyses were conducted using Wave 3 data. These contrasts evaluated change (or lack thereof) in the intervention group 3 months after intervention and change in the control group on receipt of the intervention. This design has been used to good effect in other school-based intervention contexts (Shensa et al., 2016).

It was hypothesized that the intervention would result in (a) improved media deconstruction skills, (b) lowered perception of social norms for teen drinking, (c) less positive alcohol expectancies, (d) higher self-efficacy for refusing alcohol, (e) less interest in alcohol-branded merchandise, and (f) greater understanding of the persuasive intent of advertising.

Participants

A sample from four schools (eight classes) in the Sydney metropolitan region agreed to participate in the research ($n = 216$). The four schools were selected based on similar Index of Community Socio-Educational Advantage (ICSEA) values (ranging from 1040 to 1045), to ensure comparability between schools. The ICSEA value considers parent occupation and education levels, remoteness, and percentage of indigenous student enrollment (Australian Curriculum Assessment and Reporting Authority, 2014). There has been little focus on research in higher socioeconomic status populations, despite higher rates of substance use (Humensky, 2010). The four schools were therefore selected because of their relatively high socioeconomic status and physical proximity to one another. The students from three smaller schools were combined to form the intervention group (four classes), and the students from the larger school formed the wait-list control group (four classes).

In total, 184 students (85.1% participation rate) from the sample gave self and parental consent to provide data. Students ranged in age from 9 to 12 years ($M = 10.81$, $SD = 0.65$), and 52.8% were female. The parental consent rate was 83.0% for the intervention group and 87.5% for the wait-list control group. Nineteen of the 184 students did not provide complete data across all three time points because of absenteeism, resulting in a final sample size of 165 (83 in the intervention group and 82 in the wait-list control group).

Procedure

The study protocol was approved by the University Human Research Ethics Committee, the State Education Research Application Process (SERAP), and the school sites.

The program was delivered to the Grades 5 and 6 classes over a 10-week term. One lesson was taught each week by a qualified teacher (the first author of this article) to increase implementation fidelity. The classroom teacher was also present in the room at all times as a professional learning experience and to observe implementation. The media literacy program was delivered as part of the normal English (Language Arts) and PDHPE school curriculum; however, data were collected only from those with parental and personal consent.

Measures

Program impact was assessed using a student questionnaire that took approximately 20 minutes for each class to complete and that was administered at three time points (approximately 2 weeks before the intervention group received the program, immediately after the intervention group completed the program, and immediately after the wait-list control group completed the intervention). A protocol was followed to ensure that each class received identical instructions. Each question was read aloud by the researcher to account for differences in students' reading abilities. The outcomes measured included media deconstruction skills, perceived social norms, positive alcohol expectancies, self-efficacy to refuse alcohol, preference for alcohol-branded merchandise, and understanding of persuasive intent. The media deconstruction skills measure was indexed by six qualitative questions. All other survey items adopted a 5-point Likert scale (i.e., ranging from *NO, strongly disagree* to *YES, strongly agree*). See Table 1 for a description of the measures and the individual items included in each measure.

Analyses

To evaluate the efficacy of the intervention, data were analyzed using a 2 (Condition) × 3 (Time) analysis of variance with a between-subject factor of Condition (intervention, wait-list control) and a within-subjects factor of Time (Wave 1, Wave 2, Wave 3). Analysis of variance intervention effects were of particular interest, given that this effect identifies differences in the degree of pre-test to post-test change between the intervention and control groups. One participant was excluded from the Wave 3 analysis because the person's scores on all of the items indicated a misinterpretation of the questionnaire scales. There were no performance-related reasons to exclude any other participants' data. Because of extreme skewness for some variables, patterns of significance were compared between winsorized/transformed and original data. Discrepancies were found only for alcohol expectancies, in which case the transformed data are reported. Results were considered significant if $p < .05$, using a two-tailed test. Eta squared (η^2) was calculated as a measure of effect size,

with .01, .06, and .14 representing small, medium, and large effects, respectively (Cohen, 1969).

Results

Comparability between intervention and control groups

The sample included approximately equal numbers of boys and girls and slightly more sixth-grade students. The majority of students spoke English as the main language at home. Intervention and control groups did not differ significantly in terms of gender, grade, or language spoken at home, according to chi-square analyses (all $ps > .05$). Of 83 participants in the intervention group, 91.5% missed no more than 2 of the 10 lessons. Of 82 participants in the wait-list control group, 82.7% missed no more than 2 of the 10 lessons. Missed lessons were due to student sickness and extracurricular activities, common reasons for absence in elementary schools.

Analyses

Group means and 95% confidence intervals (CIs) for the intervention and control groups can be found in Tables 2 and 3.

Media deconstruction skills. Consistent with expectations that media deconstruction scores would improve after the intervention, the Time × Condition interaction was significant, $F(2, 326) = 29.78$, $p < .001$, $\eta^2 = .10$. Post hoc analyses indicated that the intervention group improved from Wave 1 to Wave 2, $t(86) = -10.66$, $p < .001$, $\eta^2 = .57$, and these gains were maintained at Wave 3, $t(85) = -12.25$, $p < .001$, $\eta^2 = .00$. The wait-list control group also improved after the intervention, with improvement from Wave 2 to Wave 3, $t(86) = -7.33$, $p < .001$, $\eta^2 = .38$, and these posttest results were significantly higher than at Wave 1, $t(81) = -7.63$, $p < .001$, $\eta^2 = .42$. The results thus suggest an increase in media deconstruction skills as a result of the intervention in both groups, in comparison to normal attitudinal change in the control group, and that the benefits were maintained 3 months after the intervention was given to the intervention group.

Perceived social norms. Also consistent with the expectation of lowered perceptions of social norms for teen drinking, the Time × Condition interaction was significant, $F(2, 322) = 9.56$, $p < .001$, $\eta^2 = .05$. Post hoc analyses indicated that the intervention group showed decreased scores from Wave 1 to Wave 2, $t(85) = 4.35$, $p < .001$, $\eta^2 = .18$, improvements that were maintained at Wave 3, $t(84) = 3.53$, $p = .001$, $\eta^2 = .13$. The wait-list control group also showed decreased scores from Wave 2 to Wave 3, $t(86) = 5.84$, $p < .001$, $\eta^2 = .28$, with these posttest decreases significantly lower than at Wave 1, $t(80) = 4.45$, $p < .001$, $\eta^2 = .20$. Both groups again showed a significant effect of the intervention for decreasing

TABLE 1. Variables included in questionnaire

Variable	Description	Cronbach's α
Media deconstruction skills	This six-item scale, adapted from existing alcohol media literacy programs (Kupersmidt et al., 2010, 2012), measured students' ability to deconstruct alcohol advertisements. Students viewed an advertisement for the alcoholic beverage Midori and then responded to the following items: (1) What product is being sold in the ad? (2) What type of person do you think would like this ad (for example, male or female, child or adult)? Explain your answer. (3) What is the purpose of this ad? (4) What did the people who made the ad do to persuade people to buy the product? List as many thoughts as you can. (5) What do they want you to think about this product? Finish this sentence: If I get this product, then ___ . (6) Is there anything this ad is not telling you about the product that you would need to know before buying or using it? Explain your answer.	.94
	A coding framework guided the number of marks awarded for each item on the measure. For example, up to two marks could be awarded for item 1. The full two marks were awarded if the student correctly named the alcohol brand depicted (Midori) or wrote "alcohol"/"beer"/"wine"/"a cocktail drink"/"a green spirit"/"vodka." One mark was awarded if the student wrote 'drink' (includes "tea," "green," and "fizzy"), and zero marks were awarded if the student wrote "Greenland," "a hotel," or "a destination."	
	Interrater reliability was calculated for 10% of the media literacy questions because of the measure's subjective nature. Initial codings by the researcher and an expert rater showed strong interrater reliability for Wave 1 (ICC = .93), Wave 2 (ICC = .96), and Wave 3 (ICC = .92) of the questionnaire. Coding benchmarks generated from this process guided all subsequent codings by the researcher. A higher score indicates greater media literacy skills.	
Perceived social norms	This four-item scale measured students' perceptions of the number of people who drink alcohol. The original measure (Austin & Johnson, 1997a) was adapted to be culturally relevant to Australia. The items included (1) Australians drink, (2) Friends drink together, (3) Teenagers drink, and (4) Parties have alcohol. A lower score indicates lower perceived drinking social norms.	.83
Positive alcohol expectancies	This three-item scale, adapted from existing alcohol media literacy programs (Austin & Johnson, 1997a, 1997b), assessed beliefs concerning perceived physical and social consequences of drinking. Items included (1) Drinking helps you fit in, (2) Drinking makes you happy, and (3) Drinking makes young people seem grown up. A lower score indicates lower positive alcohol expectancies.	.75
Self-efficacy to refuse alcohol	This two-item scale measured students' self-efficacy to refuse alcohol. The two items, adapted from an existing alcohol media literacy program (Kupersmidt et al., 2010), consisted of (1) I feel like I have to drink alcohol, and (2) I would feel like I had to drink alcohol if my friends were drinking. A higher score indicates higher self-efficacy to refuse alcohol.	.78
Preference for alcohol-branded merchandise	This six-item scale measured students' preference for a non–alcohol-branded or alcohol-branded merchandise, as an indication of future drinking behavior. Adapted for our study from existing alcohol media literacy programs (Austin & Johnson, 1997a, 1997b; Kupersmidt et al., 2010), the scale consisted of images of six pairs of similar products (one that is non–alcohol branded and one that is alcohol branded).	.83
	The six pairs were (1) a blue (animal print) Australia-branded pencil case and a blue Bundaberg-branded pencil case, (2) a Hot Wheels–branded toy car and a Jim Beam–branded toy car, (3) yellow Surf Life Saving–branded flip-flops and yellow XXXX Gold–branded flip-flops, (4) a green Paul Frank–branded lunch bag and a Cougar Bourbon–branded lunch bag, (5) a Queen's Slipper–branded set of playing cards and a Jack Daniel's–branded set of playing cards, and (6) a red Nike-branded hat and a red Carlton Draught–branded hat.	
	For each pair, students had to indicate which product they preferred on a 5-point Likert scale ranging from (1) *I like A a lot more* to (6) *I like B a lot more*. A lower score indicates less preference for alcohol-branded merchandise.	
Understanding of persuasive intent	This three-item scale was based on an existing scale from an alcohol media literacy program (Kupersmidt et al., 2010) and assessed students' understanding of the persuasive intent of advertising. Statements included "The purpose of alcohol advertisements is to . . . (1) tell you everything there is to know about the product, (2) make products look better than they really are, and (3) tell you correct and accurate information about products." A higher score indicates greater understanding of persuasive intent.	.72

Note: ICC = Intraclass correlation coefficient.

TABLE 2. Intervention descriptive statistics

Variable	Wave 1		Wave 2		Wave 3	
	M	[95% CI]	M	[95% CI]	M	[95% CI]
Media deconstruction skills[a]	7.92	[7.42, 8.41]	11.41	[10.84, 11.98]	11.53	[10.95, 12.16]
Social norms[b]	3.32	[3.21, 3.43]	3.03	[2.91, 3.16]	3.08	[2.96, 3.21]
Alcohol expectancies[c]	1.82	[1.65, 1.98]	1.64	[1.48, 1.80]	1.69	[1.52, 1.85]
Self-efficacy[d]	4.28	[4.11, 4.45]	4.33	[4.07, 4.59]	4.38	[4.19, 4.58]
Branded merchandise[e]	2.15	[2.01, 2.30]	1.97	[1.81, 2.13]	1.98	[1.79, 2.17]
Persuasive intent[f]	3.52	[3.34, 3.70]	3.86	[3.65, 4.08]	4.06	[3.88, 4.25]

Notes: CI = confidence interval. [a]Scale range from 0 to 32, with a higher score indicating greater media deconstruction skills; [b]scale range from 1 to 5, with a lower score indicating lower perceived drinking social norms; [c]scale range from 1 to 5, with a lower score indicating lower positive alcohol expectancies; [d]scale range from 1 to 5, with a higher score indicating higher self-efficacy to refuse alcohol; [e]scale range from 1 to 5, with a lower score indicating less preference for alcohol-branded merchandise; [f]scale range from 1 to 5, with a higher score indicating greater understanding of persuasive intent.

perceptions of social norms for teen drinking, compared with normal attitudinal change in the control group. These effects were again sustained 3 months after the intervention.

Positive alcohol expectancies. Consistent with expectations of lowered positive alcohol expectancies, the Time × Condition effect was again significant, $F(2, 320) = 3.85$, $p = .022$, $\eta^2 = .02$. Post hoc analyses indicated that the intervention group decreased in positive alcohol expectancies from Wave 1 to Wave 3, $t(84) = -2.04$, $p = .045$, $\eta^2 = .05$ (although acute effects were not evident). The control group actually showed increased positive expectancies from Wave 1 to Wave 2, $t(82) = -2.20$, $p = .030$, $\eta^2 = .06$, although these decreased across the intervention period (Wave 2 to Wave 3), $t(85) = -2.91$, $p = .005$, $\eta^2 = .11$. The results again suggest positive effects of the intervention relative to the control, yet acute effects were evident only in the control group. In contrast, positive changes in alcohol expectancies were evident in the intervention group at 3-month follow-up (but not at posttest).

Self-efficacy to refuse alcohol. For self-efficacy to refuse alcohol, the Time × Condition interaction was significant, $F(2, 324) = 8.15$, $p < .001$, $\eta^2 = .05$. However, no change was evident for the intervention group (all ps > .05). Instead, post hoc analyses indicated that the wait-list control showed decreased scores from Wave 1 to Wave 2, $t(83) = 4.70$, $p < .001$, $\eta^2 = .21$, which then improved again by Wave 3, $t(86) = -2.83$, $p = .006$, $\eta^2 = .10$. Nevertheless, Wave 1 scores remained higher than Wave 3 scores, $t(81) = 2.39$, $p = .019$, $\eta^2 = .07$. Results thus suggest a decrease in refusal self-efficacy that was unrelated to the intervention. Although the intervention served to once again increase self-efficacy in the control group, self-efficacy remained below baseline levels for this group.

Preference for alcohol-branded merchandise. Contrary to expectations of less interest in alcohol-branded merchandise, there was only a significant main effect of Time, $F(2, 322) = 7.39$, $p = .001$, $\eta^2 = .04$. Post hoc analyses indicated a significant decrease in scores overall from Wave 1 to Wave 2, $t(168) = 3.81$, $p < .001$, $\eta^2 = .08$, which was maintained at Wave 3, $t(165) = 2.93$, $p = .004$, $\eta^2 = .05$. However, the main effect of Condition was nonsignificant, $F(1, 161) = 2.52$, $p = .115$, $\eta^2 = .02$, as was the Time × Condition interaction, $F(2, 322) = .01$, $p = .988$, $\eta^2 = .00$. The results thus suggest that students overall showed less preference for alcohol-branded merchandise over time, although the degree of decline did not significantly differ between the groups.

Understanding of persuasive intent. Also contrary to expectations of intervention-related improvements in understanding of the persuasive intent of advertising, there was only a significant main effect of Time, $F(2, 320) = 28.34$, $p < .001$, $\eta^2 = .18$. Post hoc analyses indicated a significant improvement in scores overall from Wave 1 to Wave 2, $t(167) = -4.18$, $p < .001$, $\eta^2 = .12$, and again from Wave 2 to Wave 3, $t(169) = -3.33$, $p = .001$, $\eta^2 = .07$. The main effect

TABLE 3. Wait-list control descriptive statistics

Variable	Wave 1		Wave 2		Wave 3	
	M	[95% CI]	M	[95% CI]	M	[95% CI]
Media deconstruction skills[a]	7.72	[7.22, 8.22]	7.99	[7.41, 8.57]	10.27	[9.66, 10.88]
Social norms[b]	3.22	[3.11, 3.34]	3.25	[3.12, 3.38]	2.93	[2.81, 3.07]
Alcohol expectancies[c]	1.82	[1.66, 1.99]	2.01	[1.85, 2.17]	1.80	[1.63, 1.96]
Self-efficacy[d]	4.64	[4.47, 4.81]	3.98	[3.72, 4.24]	4.44	[4.24, 4.63]
Branded merchandise[e]	2.31	[2.17, 2.46]	2.13	[1.97, 2.29]	2.15	[1.96, 2.34]
Persuasive intent[f]	3.67	[3.50, 3.86]	4.00	[3.79, 4.22]	4.24	[4.06, 4.43]

Notes: CI = confidence interval. [a]Scale range from 0 to 32, with a higher score indicating greater media deconstruction skills; [b]scale range from 1 to 5, with a lower score indicating lower perceived drinking social norms; [c]scale range from 1 to 5, with a lower score indicating lower positive alcohol expectancies; [d]scale range from 1 to 5, with a higher score indicating higher self-efficacy to refuse alcohol; [e]scale range from 1 to 5, with a lower score indicating less preference for alcohol-branded merchandise; [f]scale range from 1 to 5, with a higher score indicating greater understanding of persuasive intent.

of Condition was nonsignificant, $F(1, 160) = 2.11$, $p = .149$, $\eta^2 = .01$, as was the Time × Condition interaction, $F(2, 320) = 0.04$, $p = .958$, $\eta^2 = .00$. The results thus suggest that students showed greater understanding of persuasive intent over the course of the term, although the degree of improvement did not significantly differ between the groups.

Discussion

This study evaluated the effectiveness of a hands-on and theory-based alcohol media literacy program for Australian elementary school students that incorporated multimodal advertisements drawn from Australian advertising contexts. Results indicated that the program was effective in increasing media deconstruction skills and lowering perceptions of social norms for teen drinking. Until now, the majority of alcohol media literacy studies have been conducted in the United States. Given that exposure to alcohol advertising and alcohol misuse occurs in countries besides the United States, the absence of programs developed in other countries presents a clear gap in prevention services. The findings from this study indicate that an alcohol media literacy program designed to be culturally relevant to a specific national context can have a positive impact on core beliefs and attitudes that are known predictors/precursors of drinking behavior, and therefore may form part of an effective approach to substance use prevention.

The program's positive impact on media deconstruction skills was consistent with two previous alcohol media literacy studies, which found that students had improved media deconstruction skills as a result of the intervention (Kupersmidt et al., 2010, 2012). The current study further showed that results were maintained 3 months after the intervention. This suggests that the focus on media literacy equipped the students with critical thinking skills to understand how advertisements are constructed to position the viewer (Austin et al., 2016). Alcohol media literacy education thereby empowers students to resist the persuasive appeal of advertising and the media messages that are presented (Austin et al., 2002; Hobbs, 1998). Furthermore, alcohol media deconstruction skills have been shown to reduce the intent to use alcohol (Kupersmidt et al., 2012). Critical thinking is a necessary (but not sufficient) condition for media literacy. The program also lowered students' perceptions of social norms for teen drinking. These results differ from the results reported in other studies (Austin & Johnson, 1997a, 1997b). One study (Austin & Johnson, 1997b) found that the media literacy program held social norm perceptions steady as the control groups' perceptions became more positive about alcohol use, whereas the second (Austin & Johnson, 1997a) reported no significant changes. Given that the current study included a longer intervention than the two U.S. studies (10 lessons compared with 1 lesson), more opportunities were afforded within the lessons to

directly challenge perceptions of social norms. This finding has positive implications for alcohol prevention efforts, as several studies have demonstrated a relationship between inflated social norms and increased drinking intentions and behaviors (Berends et al., 2016; Collins et al., 2002; Larimer et al., 2004; Wambeam et al., 2014).

The wait-list control group showed increased positive expectancies over time before receiving the intervention. However, that group also demonstrated significantly lower positive alcohol expectancies after receiving the intervention, whereas the intervention group showed significantly lower positive alcohol expectancies over the subsequent months after the intervention (at Wave 3). These results are largely in line with Austin and Johnson's (1997a) study—which suggests that media literacy is a cumulative skill that may reveal strengthened effects over time. Media literacy education may also prevent otherwise naturally occurring increases in perceptions such as positive alcohol expectancies. Lower alcohol expectancies can in turn reduce the likelihood of early alcohol use among children (Cruz & Dunn, 2003).

Unlike other studies (Austin & Johnson, 1997a, 1997b; Kupersmidt et al., 2010), the program did not lead to a lowered preference for branded merchandise, improved self-efficacy to refuse alcohol, or improved understanding of the media's persuasive intent. The preference for alcohol-branded merchandise measure was adapted from existing studies to be relevant to an Australian context. Further testing of the measure may be needed to ascertain its validity for use with Australian students, as verbal protocol data from a pilot study suggested that students often did not recognize the brands that were shown in the images and were selecting preferences based on aesthetic features, such as more appealing colors, rather than preference for alcohol or non-alcohol brands. The lack of significant results for the self-efficacy measure could have been attributable to the students entering the study with a high level of self-efficacy as indicated by the high mean scores at baseline. Persuasive texts are taught during Grades 5 and 6 as part of the English (Language Arts) curriculum. It is likely that the students received instruction in this area outside of the intervention, thereby leading to improvements for both groups over the school term as a function of their educational experiences.

As with other alcohol media literacy programs, this research would benefit from a longer-term follow-up period to examine whether participation in the program resulted in the prevention or delay of actual substance use behaviors. Furthermore, the current study did not have adequate statistical power to take into account the clustering of students within classrooms (and schools), which would be remedied through future studies adopting stronger designs (e.g., a randomized controlled trial) or being sufficiently powered for alternate analyses (e.g., statistically accounting for clustering). It should also be acknowledged that, although the development of the intervention was informed by the MIP model,

key aspects of the model such as desirability and wishful identification were not measured (Austin & Johnson, 1997b; Austin et al., 2016). A strength of the researcher having implemented the program rather than the regular classroom teacher was a control over confounding variables such as differences in teaching style and assurance that the program was implemented as planned (Dusenbury et al., 2003). However, to improve the generalizability of the findings, increase school uptake of the program, and ensure its sustainability in schools, it would also be valuable to examine whether, and under what conditions, the efficacy of the program is maintained when it is taught by different classroom teachers. Another strength of the study was in its design, which permitted a replication of the intervention findings with two different cohorts of students (the intervention group and the wait-list control group) at two different time points and follow-up evaluation with the intervention group. Although a number of alcohol media literacy studies have demonstrated acute effects of an intervention, this study has demonstrated that these programs can have a lasting effect.

Conclusions

To our knowledge, this is the first study to examine the effectiveness of an alcohol media literacy program that has been developed, implemented, and evaluated in an Australian context using multimodal advertisements drawn from a range of advertising contexts. The study demonstrated positive outcomes on several measures including media deconstruction skills, social norms, and alcohol expectancies, which are known to be precursors/predictors of subsequent drinking behavior (Gordon et al., 2015). International data indicate that secondary school students (i.e., 13- to 18-year-olds) have already begun to experiment with alcohol (Centers for Disease Control and Prevention, 2014; White & Bariola, 2012). The upper-elementary school age (i.e., 10 to 12 years) is therefore an appropriate time to reinforce positive and healthy attitudes toward alcohol as the students continue to be exposed to alcohol, advertising, and marketing, as well as a range of drinking behaviors. Alcohol media literacy programs can provide pre-drinkers with rational reasons to reject alcohol advertising as they enter the adolescent period marked by greater experimentation with alcohol use.

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References

Australian Curriculum Assessment and Reporting Authority (ACARA). (2014). *Guide to Understanding 2013 Index of Community Socio-educational Advantage (ICSEA) values.* Retrieved from www.myschool.edu.au

Austin, E. W. (2007). Message Interpretation Process model. In J. J. Arnett (Ed.), *Encyclopedia of children, adolescents, and the media* (pp. 535–536). Thousand Oaks, CA: Sage.

Austin, E. W., & Johnson, K. K. (1997a). Effects of general and alcohol-specific media literacy training on children's decision making about alcohol. *Journal of Health Communication, 2,* 17–42. doi:10.1080/108107397127897

Austin, E. W., & Johnson, K. K. (1997b). Immediate and delayed effects of media literacy training on third grader's decision making for alcohol. *Health Communication, 9,* 323–349. doi:10.1207/s15327027hc0904_3

Austin, E. W., Miller, A. C.-R., Silva, J., Guerra, P., Geisler, N., Gamboa, L., . . . Kuechle, B. (2002). The effects of increased cognitive involvement on college students' interpretations of magazine advertisements for alcohol. *Communication Research, 29,* 155–179. doi:10.1177/0093650202029002003

Austin, E. W., Muldrow, A., & Austin, B. W. (2016). Examining how media literacy and personality factors predict skepticism toward alcohol advertising. *Journal of Health Communication, 21,* 600–609. doi:10.1080/10810730.2016.1153761

Banas, J. A., & Rains, S. A. (2010). A meta-analysis of research on Inoculation Theory. *Communication Monographs, 77,* 281–311. doi:10.1080/03637751003758193

Bava, S., & Tapert, S. F. (2010). Adolescent brain development and the risk for alcohol and other drug problems. *Neuropsychology Review, 20,* 398–413. doi:10.1007/s11065-010-9146-6

Berends, L., Jones, S. C., & Andrews, K. (2016). Adolescent drinking, social identity, and parenting for safety: Perspectives from Australian adolescents and parents. *Health & Place, 38,* 22–29. doi:10.1016/j.healthplace.2015.12.006

Centers for Disease Control and Prevention. (2014, June 13). Youth risk behavior surveillance—United States, 2013. *MMWR Surveillance Summaries, 63,* No. SS-4, 1–172. Retrieved from https://www.cdc.gov/mmwr/pdf/ss/ss6304.pdf. *Erratum in Morbidity and Mortality Weekly Report, 63,* 576 (Jul. 4, 2014).

Cohen, J. (1969). *Statistical power analysis for the behavioral sciences.* New York, NY: Academic Press.

Collins, S. E., Carey, K. B., & Sliwinski, M. J. (2002). Mailed personalized normative feedback as a brief intervention for at-risk college drinkers. *Journal of Studies on Alcohol, 63,* 559–567. doi:10.15288/jsa.2002.63.559

Cruz, I. Y., & Dunn, M. E. (2003). Lowering risk for early alcohol use by challenging alcohol expectancies in elementary school children. *Journal of Consulting and Clinical Psychology, 71,* 493–503. doi:10.1037/0022-006X.71.3.493

Davis, P. C., Jr., & Rankin, L. L. (2006). Guidelines for making existing health education programs more culturally appropriate. *American Journal of Health Education, 37,* 250–252. doi:10.1080/19325037.2006.10598912

Distilled Spirits Council of the United States. (2011). *Code of responsible practices for beverage alcohol advertising and marketing.* Retrieved from http://www.discus.org/assets/1/7/May_26_2011_DISCUS_Code_Word_Version1.pdf

Dusenbury, L., Brannigan, R., Falco, M., & Hansen, W. B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research, 18,* 237–256. doi:10.1093/her/18.2.237

Gordon, C. S., Jones, S. C., & Kervin, L. (2015). Effectiveness of alcohol media literacy programmes: A systematic literature review. *Health Education Research, 30,* 449–465. doi:10.1093/her/cyv015. Erratum in *Health Education Research, 30,* 682. doi:10.1093/her/cyv027

Gordon, C. S., Jones, S. C., Kervin, L., & Lee, J. K. (2016). Empowering students to respond to alcohol advertisements: Results from a pilot study of an Australian media literacy intervention. *Aus-*

tralian and New Zealand Journal of Public Health, 40, 231–232. doi:10.1111/1753-6405.12459

Grace, D. J., & Henward, A. S. (2013). Investigating young children's talk about the media. *Contemporary Issues in Early Childhood, 14,* 138–154. doi:10.2304/ciec.2013.14.2.138

Grenard, J. L., Dent, C. W., & Stacy, A. W. (2013). Exposure to alcohol advertisements and teenage alcohol-related problems. *Pediatrics, 131,* e369–e379. doi:10.1542/peds.2012-1480

Hickie, I. (2010). Alcohol and the teenage brain: Safest to keep them apart. *Journal of the Australasian College of Road Safety, 21,* 25–26. Retrieved from http://acrs.org.au/files/papers/ACRS-Journal-Vol21_No2-May10_web.pdf

Hills, M., & Armitage, P. (1979). The two-period cross-over clinical trial. *British Journal of Clinical Pharmacology, 8,* 7–20. doi:10.1111/j.1365-2125.1979.tb05903.x

Hobbs, R. (1998). The seven great debates in the media literacy movement. *Journal of Communication, 48,* 16–32. doi:10.1111/j.1460-2466.1998.tb02734.x

Humensky, J. L. (2010). Are adolescents with high socioeconomic status more likely to engage in alcohol and illicit drug use in early adulthood? *Substance Abuse Treatment, Prevention, and Policy, 5,* 19. doi:10.1186/1747-597X-5-19

International Centre for Alcohol Policies. (2001). Self-regulation of beverage alcohol advertising. *ICAP Reports, 9.* Washington, DC: Author. Retrieved from http://www.icap.org/portals/0/download/all_pdfs/icap_reports_english/report9.pdf

Jackson, K. M., Barnett, N. P., Colby, S. M., & Rogers, M. L. (2015). The prospective association between sipping alcohol by the sixth grade and later substance use. *Journal of Studies on Alcohol and Drugs, 76,* 212–221. doi:10.15288/jsad.2015.76.212

Kupersmidt, J. B., Scull, T. M., & Austin, E. W. (2010). Media literacy education for elementary school substance use prevention: Study of media detective. *Pediatrics, 126,* 525–531. doi:10.1542/peds.2010-0068

Kupersmidt, J. B., Scull, T. M., & Benson, J. W. (2012). Improving media message interpretation processing skills to promote healthy decision making about substance use: The effects of the middle school media ready curriculum. *Journal of Health Communication, 17,* 546–563. doi:10.1080/10810730.2011.635769

Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: Examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors, 18,* 203–212. doi:10.1037/0893-164X.18.3.203

Mäkelä, K., & Mustonen, H. (2000). Relationships of drinking behaviour, gender and age with reported negative and positive experiences related to drinking. *Addiction, 95,* 727–736. doi:10.1046/j.1360-0443.2000.9557278.x

McMorris, B. J., Catalano, R. F., Kim, M. J., Toumbourou, J. W., & Hemphill, S. A. (2011). Influence of family factors and supervised alcohol use on adolescent alcohol use and harms: Similarities between youth in different alcohol policy contexts. *Journal of Studies on Alcohol and Drugs, 72,* 418–428. doi:10.15288/jsad.2011.72.418

Miller, P. M., Smith, G. T., & Goldman, M. S. (1990). Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol, 51,* 343–349. doi:10.15288/jsa.1990.51.343

Scull, T. M., Kupersmidt, J. B., & Erausquin, J. T. (2014). The impact of media-related cognitions on children's substance use outcomes in the context of parental and peer substance use. *Journal of Youth and Adolescence, 43,* 717–728. doi:10.1007/s10964-013-0012-8

Shensa, A., Phelps-Tschang, J., Miller, E., & Primack, B. A. (2016). A randomized crossover study of web-based media literacy to prevent smoking. *Health Education Research, 31,* 48–59.

Thoman, E., & Jolls, T. (2005). *MediaLit Kit—Literacy for the 21st century: An overview & orientation guide to media literacy education.* Retrieved from http://www.medialit.org/sites/default/files/mlk/01_MLKorientation.pdf

Wambeam, R. A., Canen, E. L., Linkenbach, J., & Otto, J. (2014). Youth misperceptions of peer substance use norms: A hidden risk factor in state and community prevention. *Prevention Science, 15,* 75–84. doi:10.1007/s11121-013-0384-8

White, V., & Bariola, E. (2012). *Australian secondary school students' use of tobacco, alcohol, and over-the-counter and illicit substances in 2011.* Victoria, British Columbia, Canada: Centre for Behavioural Research in Cancer, The Cancer Council Victoria.

World Health Organization. (2014). *Global status report on alcohol and health 2014.* Luxembourg: Author.