

EXPANDING URBAN AMERICAN INDIAN YOUTHS' REPERTOIRE OF DRUG RESISTANCE SKILLS: PILOT RESULTS FROM A CULTURALLY ADAPTED PREVENTION PROGRAM

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Abstract: This article examines changes in the drug resistance strategies used by urban American Indian (UAI) middle school students during a pilot test of a substance use prevention curriculum designed specifically for UAI youth, Living in 2 Worlds (L2W). L2W teaches four drug resistance strategies (refuse, explain, avoid, leave [R-E-A-L]) in culturally appropriate ways. Data come from 57 UAI students (53% female; mean age = 12.5 years) who participated in L2W during an academic enrichment class for Native youth at two Phoenix schools. Students completed a pre-test questionnaire before the L2W lessons and a post-test 7 months later. Questions assessed the use of R-E-A-L and alternative strategies commonly reported by UAI youth (change the subject, use humor). Tests of mean differences from pre-test to post-test showed significant increases in use of refuse, explain, and leave, and an expanding R-E-A-L repertoire. Use of more passive strategies (avoid, use humor) did not change significantly, except for change the subject, which increased. Changes in the use of strategies did not differ significantly by gender, age, school grades, parental education, or length of urban residence. The L2W curriculum appears effective in teaching culturally relevant communication strategies that expand UAI youths' repertoire of drug resistance skills.

INTRODUCTION

This article reports on a pilot test of a culturally adapted substance use prevention intervention designed specifically for urban American Indian (UAI) youth. The adapted curriculum, called *Living in Two Worlds* (L2W), is based on *keepin' it REAL*, a universal substance use prevention curriculum which is designed to equip youth in middle school with a repertoire of skills to resist substance use offers (Gosin, Marsiglia, & Hecht, 2003). *Keepin' it REAL* is a model program for middle school

students on the National Registry of Evidence-Based Programs and Practices (Substance Abuse and Mental Health Services Administration [SAMHSA], 2011a). The original program teaches the four drug resistance strategies (refuse, explain, avoid, leave [R-E-A-L]) used most often by youth in the United States and Mexico (Alberts, Miller-Rassulo, & Hecht, 1991; Kulis, Marsiglia, Castillo, Becerra, & Nieri, 2008; Kulis, Marsiglia, Ayers, Calderón-Tena, & Nuño-Gutierrez, 2011; Marsiglia, Kulis, Martinez Rodriguez, Becerra, & Castillo, 2009). The L2W curriculum is designed to reflect the social contexts in which UAI youth are exposed to substances and culturally influenced ways of responding to offers to use them. This article describes changes in the nature and frequency of use of drug resistance strategies as reported by UAI students who participated in a pilot test of the adapted prevention curriculum at two sites.

Substance Use among AI Youth

Prevention programs for AI youth that teach drug resistance strategies are vitally important given the severe impact of substance use on many AI communities. AIs have disproportionately higher rates of preventable diseases resulting from substance use. Of the 10 leading causes of death among AIs, 4 are closely linked to substance use: liver disease and cirrhosis, injuries, suicide, and homicide (Centers for Disease Control and Prevention, 2001). Age-adjusted rates of death resulting from alcohol dependence are reported to be as much as six times higher for AIs than for the general population of the U.S. (Indian Health Service, 2009).

Research on different populations of AI youth has often reported that they are highly vulnerable to substance use, although rates of use vary markedly by substance, region, and tribal background (Beauvais, 1996). For example, in a recent national survey, AI adolescents (12-17 years of age) reported lower rates of current alcohol use than their Hispanic and non-Hispanic White counterparts (SAMHSA, 2011b). Compared to non-Native youth, however, AI adolescents have reported earlier onset, higher rates, and less perceived harmfulness of substance use in some studies (Moncher, Holden, & Trimble, 1990; SAMHSA, 2004). Studies of AI youth have also found that alcohol and substance use are associated with risky sexual behavior, mental health problems, and suicidality across clinical, community-based, reservation, urban, national, and statewide samples (Dickerson & Johnson, 2012; Hellerstedt, Peterson-Hickey, Rhodes, & Garwick, 2006; Kaufman et al., 2007; Marsiglia, Nieri, & Stiffman, 2006; Potthoff et al., 1998; Stiffman, Striley, Brown, Limb, & Ostman, 2003). The severe health threats linked to AI youth substance use present an urgent need for effective prevention approaches.

Prevention through Drug Resistance Training

The systematic incorporation of drug resistance skill training in prevention programs is supported by communication competence theory (Spitzberg & Cupach, 1984), which posits that youth are better able to competently resist using substances when they possess the knowledge, skills, and appropriate motivation regarding various ways of communicating effectively (Bandura, 2001; Griffin, Botvin, Scheir, Epstein, & Doyle, 2002; Gosin et al., 2003). The knowledge component relates to understanding the effects and consequences of substance use, while the skills component involves effective ways of interacting and communicating to resist substance offers. Motivation encompasses normative (dis)approval of substance use, the attitudes of peers towards substance use, and expected consequences of substance use. Together, these components facilitate divergent thinking, the ability to consider multiple strategies in a substance offer situation until an effective strategy is identified (Wright, Nichols, Graber, Brooks-Gunn, Botvin, 2004). Relying on only one strategy may be inadequate because pressure from the offeror may increase after initial resistance to the offer (Alberts, Hecht, Miller-Rassulo, & Krizek, 1992). A wide repertoire of drug resistance skills is needed, too, because substance offer interactions unfold in different ways depending on the setting, the person offering, and the particular substance. Youth are particularly susceptible to substance offers from peers, increasing the need for good communication skills (Alberts et al., 1991; Alberts et al., 1992; Botvin & Botvin, 1992). Youth are less likely to use substances if they are socially adept at turning down substance offers while also maintaining valued relationships with peers (Doi & DiLorenzo, 1993; Griffin et al., 2002; Skara & Sussman, 2003).

Prevention programs that teach a repertoire of drug resistance strategies have been found to be effective among multicultural samples including non-Hispanic White, Latino, and African American youth (Botvin, Schinke, Epstein, & Diaz, 1994; Kulis et al., 2005; Hecht et al., 2003). The drug resistance strategies taught in the *keepin' it REAL* curriculum—refuse, explain, avoid, leave—represent a variety of approaches to resisting substance offers. The refuse strategy is to turn down a substance offer verbally or nonverbally without an explanation. The explain strategy declines the offer while providing an explanation or excuse. The avoid strategy is to decide to stay away from situations or places where substances might be offered. The leave strategy is to physically exit situations when substances are offered (Marsiglia & Hecht, 2005). The *keepin' it REAL* curriculum extended prior prevention models that teach drug resistance and life skills (Botvin, Griffin, Diaz, & Ifill-Williams, 2001) by incorporating values and practices from diverse ethnic groups that promote cultural protection against substance use (Castro, Proescholdbell, Abeita, & Rodriguez, 1999). The curriculum was designed to be culturally grounded (Marsiglia & Kulis, 2009), that is, embedded in the cultural values of the target populations, rather than merely composed of

symbolic cultural representations, such as superficial alterations to language, examples, or visual images. The *keepin' it REAL* program was systematically grounded in the communication styles and cultures of three youth populations—Mexican American, African American, and non-Hispanic White—and this multicultural intervention was proven effective in preventing substance use and reinforcing anti-drug norms and attitudes among youth from these racial and ethnic groups in a randomized controlled trial (Hecht et al., 2003; Kulis et al., 2005). The *keepin' it REAL* program was, however, found to be not as effective for UAI youth, a group that was not explicitly targeted in the program's development (Dixon et al., 2007). In the randomized trial, over 400 UAI youth who participated in *keepin' it REAL* reported steeper trajectories of alcohol and marijuana use compared to both their non-Native counterparts and to UAI youth not in the program. Additional research with UAI youth found evidence of distinctive social and cultural contexts of substance offers and culturally influenced ways of handling such offers (Hurdle, Okamoto & Miles, 2003; Kulis, Okamoto, Rayle, & Sen, 2006; Okamoto, Hurdle and Marsiglia, 2001; Okamoto, LeCroy, Dustman, Hohmann-Marriott, & Kulis, 2004; Okamoto et al., 2006, Rayle et al., 2006; Waller, Okamoto, Miles, & Hurdle, 2003). This research suggested the need for an adaptation of the *keepin' it REAL* curriculum to incorporate culturally distinctive worldviews, authentic examples of substance use scenarios, and drug resistance strategies.

Cultural Program Adaptation for UAI Youth

Although a detailed description of the adaptation process is beyond the scope of this article (see Reeves, Dustman, Kulis, & Harthun, in press), the comprehensive summary below emphasizes the aspects of the process that bear most directly on this article, with illustrative examples of each stage.

The adaptation of *keepin' it REAL* for UAI youth followed the cultural adaptation model proposed by Castro and colleagues (Castro, Barrera & Martinez, 2004), which systematically incorporates three types of information: (1) prior research on ecological risk and resiliency factors and environmental contexts of substance use among UAI students; (2) ways that UAI youth typically encounter and respond to substance offers; and (3) representations of UAI cultural values and heritage based on feedback from several UAI constituencies: middle school students; their parents; and elders, other leaders, and professionals from the UAI community.

Research has shown how risk and resiliency related to substance use for AI youth emerge from interdependent relationships with peers and family members in schools, reservations, and communities (Hurdle et al, 2003; Waller et al., 2003; Trotter, Rolf, & Baldwin, 1997). A frequently documented risk factor is the prevalent exposure of AI youth to substance use within the family. This exposure may occur through permissive substance use attitudes held by parents and other

family members, substance offers made to youth by their relatives, and adult models of substance use and addiction (Bates, Beauvais, & Trimble, 1997; Hurdle et al., 2003; King, Beals, Manson, & Trimble, 1992; LeMaster, Connell, Mitchell, & Manson, 2002; Moran & Reaman, 2002; Oetting, Beauvais, & Edwards, 1988; SAMHSA, 2004; Swaim, Oetting, Thurman, Beauvais, & Edwards, 1993; Trotter et al., 1997; Waller et al., 2003; Yu & Stiffman, 2007; Yu, Stiffman & Freedenthal, 2005). Peers, siblings, and cousins also exert strong influences on AI youth to use substances or resist their use (Trotter et al., 1997). Cousins are very influential in the substance use decision making of UAI youth due to their frequent interaction in multiple environments (e.g., schools, neighborhoods, reservations; Waller et al., 2003). The adapted L2W curriculum incorporated narratives of UAI youth who described actual scenarios where they had encountered substance offers, including the specific setting and their relationship to the person offering the substance (Kulis et al., 2006; Okamoto et al., 2004).

The adapted curriculum also incorporated culturally specific drug resistance strategies identified in prior research. Qualitative studies show that, although large proportions of UAI youth use the four R-E-A-L drug resistance strategies, they employ them in distinctive ways and supplement them with other means of resisting substance use (Kulis & Brown, 2011; Kulis, Reeves, Dustman and O'Neill, 2011). For example, when utilizing the refuse strategy they emphasize respectful ways to say “no” to an offer, and often follow a direct refusal with some version of the explain strategy. In addition to avoiding situations where substances were offered, they rely on passive strategies to evade using substances while remaining present when offers occur (e.g., redirecting attention away from the substance offer by changing the subject or using humor). These nonconfrontational approaches may be preferred culturally because they allow AI youth to remain in social situations and preserve relationships with key members of their peer and family networks (Okamoto et al., 2001).

The cultural adaptation also incorporated elements of AI cultural heritage into the curriculum lessons. The integration of traditional knowledge and values into self-identity can serve as a protective factor for Native youth by promoting ethnic pride, self-esteem, and interpersonal skills (Beauvais, 1998; Broderick, 1991; Kulis, Napoli, & Marsiglia, 2002; Marsiglia, Cross, & Mitchell-Enos, 1999; Weaver, 1996). Appropriate cultural content has also been shown to increase the effectiveness of prevention curricula for AI youth (Schinke et al., 1988). UAI youth have complex and varied ethnic and cultural identities, making it challenging to identify shared elements of cultural heritage that resonate among those from different tribal backgrounds and with different family histories of migration from reservation to urban communities.

For L2W, shared cultural elements were identified by four groups of UAIs who were recruited through a collaboration among the research team, leaders of local urban Indian centers, and school district personnel in charge of AI programs: an AI steering group, focus groups with UAI adults

and students, and local and national curriculum experts (see Reeves et al., in press, for details). Because of IRB concerns, group meetings were not video- or audio-taped; instead, research team members took extensive notes.

The steering group is an advisory body for the research team's university research center, and is comprised of UAI community leaders, Native K-12 educators and counselors, and center researchers who work with the local UAI community. The steering group reviewed the curriculum development; gave feedback on content, format, and teaching strategies; and made recommendations about recruitment, content, and format of the adult focus groups.

Four of these adult focus groups were held, with a total of 12 UAI participants: parents, educators, and/or providers serving the UAI community. The focus group participants discussed what UAI youth should know to keep themselves safe in dangerous or risky situations, and which elements of AI culture should be embedded in a program for UAI adolescents.

The 20 UAI students who participated in two adolescent focus groups attended public middle schools in the local urban area. Led by Native facilitators, the students identified culturally influenced ways of responding appropriately to offers of alcohol, cigarettes, and other drugs (Kulis & Brown, 2011; Kulis, Reeves, Dustman, & O'Neill, 2011).

The research team identified curriculum experts locally through the AI steering group and contacts with the university's American Indian Studies department. National curriculum experts familiar with prevention curricula for Native youth were identified through contacts within professional associations and by project consultants. The experts reviewed an interim draft of the curriculum and provided feedback about the appropriateness of the content and format via a standard set of questions.

Although the members of the four groups that provided input on cultural content for the L2W curriculum were not formally asked to identify their tribal affiliations, their comments often made reference to their tribal heritage and represented a range of backgrounds and life experiences. The research team analyzed this feedback to identify the intertribal cultural elements—those that are meaningful across tribes—that were most commonly and widely seen as essential for culturally grounding UAI youth, and as protective and promotive of their well-being.

The qualitative data analysis was designed to identify emergent themes rather than a priori categories (Corbin & Straus, 2008). Several members of the research team, including AI members, worked independently to identify and code themes, grouping highly similar responses to reach saturation (Guest, Bunce, & Johnson, 2006). The coders then labeled and defined the categories based on team consensus, arriving at the following set of recurring themes: ancestry (including clans or bands), Native spirituality, oral traditions/storytelling, connection to reservation or "home," sacred history, ritual, respect, traditional language, and traditional beliefs (which represent the continuity

of culture and identity, passed down by elders, that helps youth understand their origins and their role in the community). These cultural heritage elements were systematically incorporated into the adapted curriculum through examples and exercises.

Based on the three sources of information used in the cultural adaptation model (prior research on ecological risk and resiliency factors, prior research on circumstances surrounding substance offers and responses, and cultural norms), *keepin' it REAL* was adapted to reflect the contexts of substance offers and use among UAI students in central Arizona. The L2W adaptation used culturally appropriate content, language, and delivery formats; fidelity to the core components of the *keepin' it REAL* program was preserved. These components include the R-E-A-L drug resistance strategies; communication competence training (Spitzberg & Cupach, 1984); a narrative-based approach—much like storytelling—to enhance identification with the prevention messages (Holland & Kilpatrick, 1993); social norms as motivators in substance use, such as adolescents' personal norms about whether substance use is (un)acceptable, expected (dis)approval of substance use by peers and parents, and perceptions of peer substance use (Cialdini, Reno, & Kallgren, 1990); and social learning theory (Bandura, 2001) to teach life skills and their role in risk assessment and decision making (Hecht et al., 2003). The adaptation presented the R-E-A-L strategies in a new order, and in variations that demonstrated culturally appropriate ways to utilize them. For example, the original program taught the avoid strategy primarily as a way to stay out of risky situations. It was expanded in L2W to include ways that UAI youth may use evasive tactics to eschew using substances in situations they cannot avoid, such as pretending to use substances offered by their cousins or discreetly discarding substances offered by adult family members. In addition to R-E-A-L, the research team incorporated other strategies that UAI youth had reported during the qualitative research phase, including redirecting (i.e., changing the subject) and using humor to deflect substance offers. The research team redesigned the curriculum examples to reflect AI cultural values and worldviews, and explorations of Native cultural heritage were interwoven into each lesson.

The purpose of the current study was to assess changes in the use of R-E-A-L and other strategies by the students who participated in a pilot test of the L2W curriculum. The specific objectives were to determine whether their use of R-E-A-L strategies increased, and whether they shifted from reliance on certain types of strategies to others, such as from relatively passive (avoid, change the subject) to more assertive or direct (refuse, explain, leave) means of resisting substance offers.

METHODS

The student respondents for this study ($N = 57$) were AI youth in the 7th or 8th grades enrolled in two urban schools in the Phoenix metropolitan area in the fall of 2008. These two schools were chosen because they offer voluntary academic and cultural enrichment programs specifically for AI youth. Official school district reports indicated that youth of AI background accounted for 5-11% of enrolled students at the schools. The respondents for the study comprised a nearly gender-balanced sample (53% female) and were age appropriate for 7th or 8th grade (mean age = 12.5 years; range, 11-15 years). All but one of the students said they belonged to an AI tribe or reservation community. Over 95% of the affiliations mentioned were with Arizona tribes or reservation communities. Reflecting the tribal backgrounds of the AI population in Phoenix, the tribe mentioned most often was Navajo (Diné). Most of the remaining affiliations were with the Apache, Hopi, or Tohono O'odham tribes.

The study followed human subjects protection policies of the researchers' university IRB, of the students' schools and school districts, and of the social service agency sponsoring the academic enrichment program. All of the youth who participated in the voluntary program were identified to the school as AI by their parents at the time of school enrollment. Every AI student enrolled in the voluntary academic enrichment program in the study schools was invited, and agreed, to participate in the study. Active parental consent and student assent were obtained from all the participants, starting with an explanatory letter sent home to parents/guardians. Every effort was made to obtain consent and assent in a non-coercive manner.

Students completed a pre-test questionnaire before the first L2W lesson and a post-test questionnaire 1 month after the lessons were finished, 7 months after the start of the project. University-trained proctors carried out the one-hour self-administered, written questionnaire in the students' regular classrooms. Students were informed that the questionnaire was part of a university research project, their participation was voluntary, and their answers were confidential. They were given the option to return a signed assent form and complete the questionnaire, or to return the assent form unsigned along with a blank questionnaire, without drawing attention to their choice not to participate. No blank questionnaires were returned at either pre- or post-test. Consented students who were absent on the initial date, or were unable to finish within the allotted time, were able to complete the questionnaire in class within the subsequent two-week period. Seven students who completed only the pre-test or the post-test, but not both, were not included in the analysis.

Twelve lessons of the L2W curriculum were delivered during the next 5 months during the regular class period for the Native educational and cultural enrichment program. Some lessons spanned multiple weekly classes. The lessons were delivered by a Native facilitator provided by the

largest social and educational service agency serving AIs in the metropolitan area. The facilitator received extensive training in delivery of the L2W curriculum from the research team.

Measures: The questionnaires asked students the number of times they used R-E-A-L strategies, as well as alternative strategies commonly reported by UAI youth in the focus group. The research team constructed multiple item measures of the use of seven drug resistance strategies, with parallel measures at pre- and post-test. The respondents indicated how often in the last 30 days they had used each specific strategy to deal with substance offers. (They were not asked to report the total number of times they were offered substances, or whether they chose between using a strategy and using a substance—only how often they used each strategy.) The strategies were described as follows. (1) “...said ‘No’ without giving a reason why?” (Refuse); (2) “...gave an explanation or excuse to turn down the offer?” (Explain); (3) “...avoided people or places because you might be offered [alcohol/cigarettes/marijuana]” (Avoid); (4) “...left the situation without accepting the offer?” (Leave); (5) “...changed the subject to talk about something else?” (Redirect); (6) “...made a joke or did something to make people laugh?” (Humor); (7) “...used some other way not to accept the alcohol/cigarettes/marijuana?” (Other). There were three questions for each strategy, referring in turn to ways that students dealt with offers of alcohol, of cigarettes, and of marijuana. The responses to each individual item were coded as the number of times the strategy had been used: 0, 1, 2, or 3 (or more) times. The research team calculated a score for each strategy by summing the responses to the three relevant items. In addition to measuring frequency of use of each strategy, the research team analyzed the strategies as dichotomies—whether the strategy had been used, regardless of frequency. Finally, the team calculated the size of each student’s R-E-A-L repertoire: the number of different R-E-A-L strategies s/he had used in the last 30 days (0 to 4), regardless of frequency.

Demographic characteristics employed in the analysis included gender (0 = male, 1 = female), age (in years), academic performance (usual school grades, from 1 = *mostly F’s*, 2 = *D’s and F’s*, 3 = *mostly D’s*, 4 = *C’s and D’s*, 5 = *mostly C’s*, 6 = *B’s and C’s*, 7 = *mostly B’s*, 8 = *A’s and B’s*, 9 = *mostly A’s*), highest parental education (1 = *less than high school*, 2 = *high school*, 3 = *beyond high school*), family type (0 = *one-parent household*, 1 = *two-parent household*), and length of urban residence (1 = *less than 1 year*, 2 = *1-5 years*, 3 = *more than 10 years*, 4 = *all my life*).

Analysis strategy: The research team assessed statistically significant changes in the number and type of drug resistance strategies through paired *t*-tests of mean differences in the frequency of their use from pre-test to post-test. Additional results present the proportion of students using each strategy at pre-test and post-test; the proportions who used the strategies with increasing, decreasing, and unchanged frequency; and those who used them neither at pre-test nor at post-test. Unlike the tests of mean differences—which can be influenced by large changes in frequency of use of the strategies by minorities of the students—these proportions reveal how commonly students

changed their behavior and in which direction, and they separate students who had no opportunity to use some strategies because of little or no exposure to substance offers in the prior month. We also tested whether changes in the frequency of use of strategies varied by demographic characteristics, using residual change regression models.

RESULTS

Table 1 presents descriptive statistics at pre-test and post-test on the use of drug resistance strategies in the last 30 days, as well as paired *t*-tests of mean differences in their use. The strategy used most commonly at pre-test was avoid, which was used by more than half the students and with a mean frequency that was more than twice that of any other strategy. The strategies used least often at pre-test were leave and unspecified other strategies, which were used by only about one-quarter of the students. The proportion of students using each strategy increased from pre-test to post-test, such that the mean frequency of use of the different strategies clustered within a narrower range at post-test. *T*-tests of mean differences showed significant increases from pre-test to post-test in use of three of the R-E-A-L strategies: refuse, explain, and leave. Use of redirect and unspecified other strategies also increased significantly. Use of the avoid strategy declined slightly but non-significantly, and use of humor increased non-significantly. The size of the students' R-E-A-L repertoire also increased significantly. A typical student used 1.5 of the four R-E-A-L strategies at pre-test but 2.24 of them at post-test, and the proportion using at least one of the R-E-A-L strategies grew by 10% from pre-test to post-test.

Table 1
Use of Drug Resistance Strategies in the Last 30 Days, at Pre-test and Post-test (N = 57)

Variable	Pre-test			Post-test			t-test
	Mean	SD	% Non-zero	Mean	SD	% Non-zero	
Refuse	1.06	2.16	32.6%	2.04	2.48	56.1%	2.25*
Explain	1.25	2.31	34.7%	2.04	2.29	57.5%	1.84*
Avoid	2.63	3.37	54.2%	2.29	2.57	57.1%	-0.61
Leave	0.87	1.93	28.8%	1.75	2.28	52.6%	2.22*
Redirect (Change subject)	1.17	2.12	35.1%	2.00	2.51	54.6%	1.91*
Humor	1.27	2.11	38.1%	1.79	2.28	52.1%	1.24
Other strategy	0.89	2.02	25.8%	2.18	2.68	55.8%	2.89**
REAL Repertoire	1.50	1.48	65.3%	2.24	1.61	75.4%	2.73**

One-tailed tests:

* $p < .05$

** $p < .01$

Means for the demographic variables at pre-test (data not included in Table 1) indicated that a majority of the students were female (53%) and living with both parents (63%) rather than one parent (all lived with at least one parent, and approximately 20% also lived with a grandparent). The average student was 12.5 years old, with typical school grades corresponding to C's and D's, high-school educated parent(s), and more than 10 years of residence in the urban area. Although exact data on substance offers were not collected, more than four fifths of the students noted that they were at least sometimes in situations where alcohol, cigarettes, marijuana, or other drugs were available to them.

Table 2 depicts the changes in use of drug resistance strategies from pre-test to post-test in another way, by dividing the students into four categories: those who never used the strategy at pre- or at post-test, those who used it at both times at the same frequency, those whose use decreased in frequency, and those whose use increased in frequency. The distributions were very similar for five strategies: refuse, leave, redirect, humor, and unspecified other. For these, approximately one-third of the students never used the strategy, a small minority (6-9%) used it at the same frequency, a somewhat larger minority (14-20%) decreased their use, and approximately 40% increased their use. The distributions for explain and for the R-E-A-L repertoire showed an even larger proportion—47% and 50% respectively—that increased their use. Finally, the avoid strategy had a singular distribution: the proportions of students increasing and decreasing its use were nearly equivalent. The proportion of students who never used a strategy at pre- or at post-test—which included those who had not been offered substances in the prior 30 days—varied from 22% for avoid to 36% for leave and unspecified other strategies.

Table 2
Pre-test to Post-test Changes in Frequency of Use of Drug Resistance Strategies (N = 57)

	Refuse	Explain	Avoid	Leave	Redirect	Humor	Other	REAL Repertoire
No Use	33.0%	28.3%	22.1%	26.1%	31.9%	33.9%	36.3%	23.2%
Same	6.8%	4.9%	11.1%	6.5%	7.9%	8.8%	7.0%	4.7%
Decreased	17.2%	19.5%	33.0%	15.3%	19.8%	20.4%	13.5%	22.5%
Increased	43.0%	47.4%	33.9%	42.1%	40.4%	37.0%	43.2%	49.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3 reports the results of residual change regression analysis models that predicted frequency of use of the drug resistance strategies at post-test. Included among the predictors in each model are the corresponding pre-test measures of the same outcome, providing a baseline adjustment. The regression coefficients thus indicate how the demographic variables predicted change in these

outcomes from pre-test to post-test. Only one effect was statistically significant: students living in two-parent households used the avoid strategy less than those living with one parent; there was a non-significant effect in the same direction for all other strategies.

Table 3
Regression Analysis Predicting Frequency of Use of Drug Resistance Strategies at Post-test,
Adjusting for Pre-test Frequency (N = 57)

	Refuse	Explain	Avoid	Leave	Redirect	Humor	Other	REAL Repertoire
Pre-test Frequency	0.238 <i>0.283^a</i>	0.103 <i>0.180</i>	0.176 <i>0.114</i>	0.233 <i>0.210</i>	0.276 <i>0.245</i>	0.287 <i>0.228</i>	0.207 <i>0.245</i>	0.210 <i>0.146</i>
Gender (Male = 0, Female = 1)	-0.505 <i>0.735</i>	-0.474 <i>0.782</i>	0.656 <i>0.846</i>	0.065 <i>0.738</i>	-0.487 <i>0.916</i>	-0.144 <i>0.888</i>	-0.343 <i>1.050</i>	-0.228 <i>0.471</i>
Age	-0.067 <i>0.367</i>	-0.018 <i>0.351</i>	0.088 <i>0.328</i>	0.019 <i>0.380</i>	0.085 <i>0.419</i>	0.101 <i>0.314</i>	0.052 <i>0.305</i>	0.122 <i>0.250</i>
School Grades	-0.132 <i>0.205</i>	-0.145 <i>0.156</i>	0.092 <i>0.178</i>	-0.214 <i>0.237</i>	-0.185 <i>0.172</i>	-0.186 <i>0.183</i>	-0.281 <i>0.220</i>	-0.063 <i>0.100</i>
Two-parent Family	-0.436 <i>0.921</i>	-0.865 <i>0.950</i>	-2.297* <i>1.015</i>	-0.581 <i>1.020</i>	-0.544 <i>0.957</i>	-0.523 <i>1.011</i>	-0.704 <i>0.895</i>	-0.669 <i>0.539</i>
Parental Education	-0.378 <i>0.336</i>	-0.486 <i>0.375</i>	-0.260 <i>0.375</i>	-0.362 <i>0.388</i>	-0.407 <i>0.348</i>	-0.252 <i>0.432</i>	-0.440 <i>0.413</i>	-0.237 <i>0.180</i>
Time in Urban Area	0.079 <i>0.316</i>	0.146 <i>0.276</i>	0.328 <i>0.254</i>	0.226 <i>0.272</i>	0.109 <i>0.334</i>	0.140 <i>0.339</i>	0.179 <i>0.365</i>	0.069 <i>0.150</i>
Intercept	3.351 <i>4.575</i>	2.929 <i>4.413</i>	0.888 <i>4.122</i>	0.528 <i>5.072</i>	1.231 <i>5.233</i>	-0.222 <i>3.829</i>	1.192 <i>4.578</i>	0.792 <i>3.068</i>
R ²	.142	.155	.214	.158	.176	.159	.177	.174

^a Standard errors are italicized

* $p < .05$

DISCUSSION

The L2W curriculum was designed to teach a range of drug resistance strategies based on clear communication, but fitting the social and cultural contexts in which UAI students confront offers to use substances. Results showed that the UAI students increased their reliance on more direct methods of resisting substance use offers (refuse, explain, leave). These strategies were taught explicitly in the curriculum, but in culturally appropriate ways. Students also increased their use of an indirect strategy—to redirect or change the subject. Students maintained, rather than replaced, use of relatively passive strategies (avoid, humor). They expanded their repertoire of different R-E-A-L strategies and also reported increases in the number of unspecified other strategies used.

The pilot test of the adapted L2W curriculum did not have a control group for comparison and, therefore, did not include data on rates of substance use. However, the changes reported by the participants show promising results for the program's effectiveness in expanding UAI youths' repertoire of drug resistance skills. It is notable that these results emerged despite the relatively short interval between the end of the curriculum and the post-test, and despite the resulting need to restrict measurement of use of the strategies to the prior 30 days in order to have comparable pre-test and post-test data. Measuring students' use of the strategies over a longer time period might reveal even more substantial changes. The lack of significant variation in these changes by gender, age, academic grades, and parental education provides initial indications that the program resonates well with many demographic subgroups of UAI youth. Some patterns in the regression analyses deserve closer investigation with a larger sample; the pilot's small sample size and resulting large standard errors generated only one statistically significant result.

Additional research is needed, as well, on the nature of the unspecified other strategies that UAI youth reported using with increasing frequency. It is possible that exposure to the curriculum sensitized the students to different ways of responding to substance use offers, such that they both recognized additional ways that they had been using to deal with substance offers, and developed new ways to handle such offers. As researchers identify these strategies and document their prevalence, it may be worthwhile to consider incorporating them into the repertoire of strategies taught in prevention programs for UAI youth.

However, although promising, the results provide only provisional evidence of the effectiveness of the curriculum, given that this was an exploratory pilot test with a relatively small non-probability sample of two schools in a single metropolitan area of the Southwest. Thus, the results cannot be generalized reliably to the rest of the metropolitan setting, or to other urban AI communities in the U.S. Sample selection methods may have overrepresented UAI students from families that maintain the strongest connections to their Native heritage: The student respondents were all identified to their schools as AI by their parents, and were participating voluntarily in a cultural enrichment program for Native students.

Another limitation of the study is that, without randomization or a control group, the study was not designed to assess the effect of L2W on actual substance use rates; it examined only short-term results on the use of drug resistance strategies. When data from the randomized trial of L2W (which has both short- and long-term follow-up data, and a control group) become available, it will be possible to determine whether increases in use of the R-E-A-L strategies and the expanding R-E-A-L repertoire translate into relative reductions in actual substance use. In addition, it will be helpful if future studies can distinguish between students who have an opportunity to use a R-E-A-L strategy but do not, and students who have no such opportunity. Because of the small sample

size for the pilot study, the statistical tests that were performed must be considered exploratory. Nevertheless, the consistency of the pilot results showing increases in use of three of the four R-E-A-L strategies is an encouraging indication that an existing prevention approach can be culturally adapted to resonate well with UAI communities, despite their cultural diversity, while promoting learning and application of important skills for resisting substance use.

Although the cultural adaptation process for L2W was not the primary focus of this article, the research team hypothesized that relevant cultural material could be incorporated into the curriculum based on the identification of values that were shared by UAI youth from diverse tribal backgrounds and with different urban and reservation experiences. The research team attempted to address this central yet unresolved challenge in developing prevention efforts for UAI communities using a structured qualitative research process that involved different UAI constituencies and multiple data analysts. Further reflection on that process may help in assessing the import of the quantitative results showing changes in students' use of drug resistance strategies.

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