Published in final edited form as:
J Prim Prev. 2006 March ; 27(2): 155–170. doi:10.1007/s10935-005-0016-6.

The Implications of Ecologically Based Assessment for Primary Prevention with Indigenous Youth Populations

Scott K. Okamoto[1,4], **Craig Winston LeCroy**[2], **Sheila S. Tann**[3], **Andrea Dixon Rayle**[2], **Stephen Kulis**[2], **Patricia Dustman**[2], and **David Berceli**[2]

[1] Hawaii Pacific University, 1166 Fort St. Mall, Suite 302, Honolulu, HI, 96813

[2] Arizona State University

[3] Assistant Director of Health Services Research, Denver Health and Hospitals

Abstract

This paper describes a five-stage approach toward conducting an ecologically based assessment with Indigenous youth populations, and the implications of this approach for the development and implementation of culturally grounded prevention interventions. A description of a pilot study funded by the National Institutes of Health/National Institute on Drug Abuse (NIH/NIDA) focused on drug use and American Indian youth is presented as one model for operationalizing ecologically based assessment with Indigenous youth populations, and issues related to translating the pilot study into a prevention intervention are discussed. This paper suggests that ecologically based assessment can serve as a foundation for culturally grounded prevention interventions, promoting the social and ecological validity of those interventions.

Keywords

contextual assessment; ecological assessment; youth; drug prevention; American Indian

Ecological perspectives in health promotion have been adopted by numerous social sciences including public health, sociology, psychology, education, and nursing. The universality of this paradigm lies in its description and application of addressing the interaction of reciprocal determinism between the individual and the environment (Green, Richard, & Potvin, 1996). With growing interest in primary prevention of disorders, ecological frameworks are particularly salient in that greater emphasis is placed on the role of persons, groups, and organizations as active agents in shaping health practices, risk reduction efforts, and policies intended to optimize both individual wellness and collective well-being (Stokols, 1996).

An ecological perspective in assessment and prevention is particularly relevant for Indigenous youth populations (e.g., American Indian, Alaskan Native, and Native Hawaiian youth). For example, the unique impacts of poverty, discrimination, and social isolation on the psychosocial development and adjustment of Indigenous youth are ideally examined through an ecological perspective (Gibbs & Huang, 1998). However, because of the breadth and complexity of ecological assessment, questions arise as to which components of the ecosystem are most relevant, particularly for Indigenous youth populations.

[4]Address correspondence to Scott K. Okamoto, Ph.D., Assistant Professor, Social Work Program, 1188 Fort Street Mall, Suite 430, Honolulu, HI 96813; sokamoto@hpu.edu.

The purpose of this paper is to describe the relevance of an ecologically based assessment approach for studying "at-risk" behaviors of Indigenous youth populations, and to describe its implications for the development of culturally grounded primary prevention interventions. A specific body of literature related to the social ecology of Indigenous youth populations is reviewed in this paper to contextualize one approach toward ecologically based assessment with these youth. The methodology from the American Indian Youth Pilot Project, a pilot study that is part of a larger infrastructure grant funded by the National Institutes of Health/National Institute on Drug Abuse (NIH/NIDA), is used to illustrate one approach toward ecological assessment with one potentially vulnerable subpopulation of Indigenous youth. This paper argues that ecologically based assessment serves as the foundation for culturally grounded prevention for Indigenous youth because it identifies the most salient environmental and cultural variables that form the basis of effective prevention practices.

Theoretical Underpinnings of Ecological Assessment

The practice of ecologically based assessment is supported by ecological/contextual theories. Contextualists, such as Vygotsky (1978) and Brofenbrenner (1992), emphasize that the behavior of an individual is dictated by their relationship to their environment. Ecological assessment requires knowledge of the person, the habitat, and how these systems interact, especially when in discord (Morse, 1993). Vygotsky described a dynamic relationship between the child and the environment, where the sociocultural-historical context defines and shapes the child and his or her experience, while the child simultaneously affects his or her context. As such, from a sociocultural-historical perspective, the basic unit of analysis is not "the (properties of the) individual, but the (processes of the) sociocultural activity, involving active participation of people in socially constituted practices" (Rogoff, 1990, p. 14). Vygotsky also identified a "zone of proximal development," which indicates the upper and lower limits of cognitive development based on environmental circumstances. In particular, the zone of proximal development specifies the "actual developmental level as determined by independent problem solving" and the "potential for development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86).

Research specifically focused on minority youth, including Indigenous youth, has stressed the importance of the social ecology on their behaviors. This external emphasis is reflected in the value orientation toward interdependence/collectivism of many minority youth populations (Greenfield, 1994). Research with American Indian youth has found that environmental variables serve as both risk and protection. For example, a sense of belonging to school has been shown to provide protection from drug use for American Indian youth of the Southwest (Napoli, Marsiglia, & Kulis, 2003). Trotter, Rolf, and Baldwin (1997) found through ethnographic analysis of interviews with Diné (Navajo) youth that decisions to use drugs were situated within a relational context. Sisters, brothers, and cousins of the youth respondents in their study influenced the respondents' decisions to use substances.

Similarly, research has suggested that family factors play a significant role in the substance use of Native Hawaiian youth. Makini et al. (2001) found that family support was associated with less alcohol use for these youth, while Goebert et al. (2000) found that family adversity (e.g., criminality) was related to increased incidences of substance abuse. In fact, recent research has found that, compared to their non-Hawaiian counterparts, Hawaiian adolescents interacted significantly more with their family members (Goebert et al., 2000) and received more family support (Goebert et al., 2004), suggesting that family plays an important and influential role in the lives of Native Hawaiian youth. These findings are consistent with the

family oriented value system (i.e., '*ohana* system) that is pervasive within the Native Hawaiian culture (Miike, 1996).

While ecological theories provide much practical utility in conceptualizing relevant issues pertaining to a phenomenon, they can present challenges related to their operationalization and subsequent translation into research due to their complexity. Morse (1993) stated that it is not possible to study all possible ecosystems interacting in a given scenario, and that there must be some selection in variables of interest. However, the problem is often that the selection is idiosyncratic, based on the subjective judgment of the investigator. Further, Biglan (2004) stated, "one could point to an endless number of contextual conditions for any given act" (p. 16). How, then, does one conduct a valid assessment of an act-in-context?

Operationalization of Ecological Assessment: The American Indian Youth Pilot

This section of the paper will describe the American Indian Youth Pilot project as one model for ecologically based assessment with Indigenous youth populations, and will describe selected findings from the Pilot. The purpose of the American Indian Youth Pilot project is to examine the drug use and drug resistance strategies of Southwestern American Indian Youth within five successive stages using a person-in-environment conceptualization. Unique to this approach is the emphasis individuals within situations rather than on their personal attributes. The environmental context is considered important because situations can contain subtle and complex factors that elicit poor performance (Goldfried & D'Zurilla, 1969). These situations may contain critical information needed to understand how to respond effectively. With this in mind, the overall goals of the Pilot are to create an inventory of the most salient drug related problem situations relevant to these youth, and to create a full range of competent responses to these situations. The findings from the Pilot have implications for the development of culturally grounded school-based drug prevention for Indigenous youth, as they provide the necessary foundation for social and ecological validity for prevention programs for these youth.

Stage 1: Survey Data Analysis

The goal of this stage is to determine the overall need for a culturally-focused primary prevention effort related to drug use by examining the individual and ecological constructs that may influence drug use. While numerous studies have reported higher rates, earlier onset, and more severe consequences of drug use for American Indian youth (e.g., Moncher, Holden, & Trimble, 1990; Schinke, Tepavak, & Cole, 2000), these studies have not specified the regional and tribal differences among these youth. Currently, there are 562 federally recognized tribes across the U.S. (Bureau of Indian Affairs, 2003) with significant cultural and regional differences related to living situations, cultural affiliation, and identity (Hawkins, Cummins, & Marlatt, 2004). This phase of the Pilot is important, because it examines the specific regional and tribal issues that may influence drug prevention efforts.

In this phase, survey data on drug attitudes and drug use among urban American Indian middle school students was collected as part of a federally funded drug prevention efficacy trial for Latino youth (Hecht et al., 2003). Seventh graders in 35 Phoenix area middle schools were surveyed, which yielded a subsample of 477 American Indian youth respondents. The main objectives in the analysis of the American Indian youth subsample was to (1) identify the prevalence, age of initiation, and frequency of drug use; (2) identify the degree of exposure to drugs; and (3) identify how drug use outcomes were mediated by ethnic identity, age, and gender. Based on this analysis, Kulis, Napoli, and Marsiglia (2002) found that American Indian students who had a more intense sense of ethnic pride adhered

more strongly to antidrug norms than those who did not. This suggests that ethnic pride for American Indian youth may serve as a protective factor against drug use. Some research has indicated that this might occur because the recreational use of drugs is not condoned in the traditional Native American lifestyle (Zimmerman, Ramirez-Valles, Washienko, Walter, & Dyer, 1996). Nonetheless, research on Indigenous populations has found that higher levels of ethnic pride were related to lower levels of drug use (Austin, 2004). Additionally, Napoli et al. (2003) found that Native youth who felt a stronger sense of belonging to school reported lower lifetime and monthly use of gateway drugs (i.e., cigarettes, alcohol, and marijuana) than other Native youth. This suggests that the educational context of American Indian youth may be particularly important in the etiology of their drug using behavior.

Stage 2: Assessing Environmental Demands

The primary goal of this stage was to identify the most relevant environmental situations related to drug use for American Indian youth. Using focus groups with American Indian middle school students, youth were asked to (1) elaborate on drug situations that were considered "problematic" (i.e., the effective approach for responding to the situation was not readily apparent), and (2) how they coped with the situation(s). Based on this data, Okamoto, Hurdle, and Marsiglia (2001) identified three primary drug resistance strategies used by American Indian youth: (1) *redirecting* the conversation away from drug offers, (2) *avoiding* or *leaving* the situation, and (3) *refusing* drug offers (saying "no"). While these three drug resistance strategies are not entirely unique to Indigenous youth in and of themselves, Okamoto et al. indicate that the relative preference for non-confrontational strategies may be unique to Native youth versus other youth populations. Specifically, redirecting and avoiding/leaving were preferred resistance strategies for these youth, while directly refusing drug offers tended to be used as a last resort. Further, based on the focus group data, Hurdle, Okamoto, and Miles (2003) and Waller, Okamoto, Miles, and Hurdle (2003) identified the unique familial influences related to drug use of American Indian youth. In particular, these studies suggested that cousins (either biological or ascribed) played an integral role in the youths' decisions to use drugs, because they interacted with the respondents in multiple systems (e.g., at school, on the reservation, and in the community). Waller et al. (2003) suggest that this process intensifies both risk and protection for these youth. The interaction of family, school, and community that is represented by the role of cousins may intensify risk for these youth, as they can never "escape" from their cousins' negative influences, but may also intensify protection as cousins may be constantly "looking out" for them in the school, community, and home.

Stage 3: Establishing Social Validity

The goal of this stage is to operationalize specific drug related contexts for American Indian youth, which can form the foundation for primary prevention efforts with these youth. Specifically, this stage provides the contexts for youth to develop their resistance skills related to drug use. In this stage, representative drug-related problem situations were developed and tested for social validity. Through analysis of the focus group data from Stage 2, 173 contextually-based, drug and alcohol related survey items were developed (Okamoto, LeCroy, Dustman, Hohmann-Marriott, & Kulis, 2004). The items examined the perceived frequency and difficulty of various drug-related situations in the home, school, and community. Items were sorted and reviewed so that redundant items were eliminated and similar situations were combined. This process produced a final list of 62 problem situations, which were pilot tested on another sample of American Indian youth (see Table I for a list of representative drug related problem situations; see Okamoto et al., 2004, for a full list of problem situations). The final items reflected drug-related scenarios with four different groups of people: peers (Cronbach's alpha = .97), cousins (Cronbach's α= .95), parents (Cronbach's α = .90), and adult family members (Cronbach's α = .83). Based on an

analysis of mean responses, youth in the study indicated that drug and alcohol use occurred primarily with friends or cousins at their houses or after school. The difficulty of refusing a peer ($M = 2.02$, $SD = 1.01$) or cousin ($M = 1.99$, $SD = .990$) was found to be significantly higher than that of refusing a parent ($M = 1.81$, $SD = 1.03$), $t(69) = 4.00$, $p < .001$; $t(69) = -2.33$, $p < .001$.

In order to further elucidate these findings, Kulis, Okamoto, Dixon Rayle, and Nyakoe (in press) examined the relationship between offerer (e.g., friend, peer, cousin, parent) and gateway drug use. Regression analyses indicated that youth who reported exposure to more drug use opportunities through their parents reported more frequent use of alcohol and cigarettes, while exposure to drugs through cousins predicted more frequent use of marijuana. Further, there was a significant gender effect, in that exposure to drugs through parents predicted a higher frequency of recent substance use more strongly for girls than for boys. Girls, in particular, also received more drug offers and found it more difficult to refuse these offers than boys (Dixon Rayle et al., in press). These findings suggest the need for more research focused on gender and cultural context, in order to understand the etiology of drug use for Native youth.

Stage 4: Response Enumeration

The primary goal of this stage is to obtain a sample of likely responses to each situation for the next stage, the response evaluation. This is important, because it identifies the socially competent and incompetent real world responses that American Indian youth use to deal with drug offers. This stage also provides information helpful in retaining only situations that are likely to provide potentially discriminating items for the final inventory. In a focus group format, 50 to 75 youth from the identified schools are presented with the drug related scenarios selected in the previous stage. They are told that these situations are ones that occur for many youth and that the investigators are interested in how they would react to each situation. They are asked to give all possible reactions to each of these situations. The goal in this stage is to elicit the *full range* of potentially effective responses.

Stage 5: Evaluating Social Competence for Drug Resistance

The task of this stage is to evaluate the social competence of the sample responses obtained in Stage 4. In essence, this is a determination of the degree of effectiveness of each of the potential courses of action in terms of their likely effects or consequences. The relative effectiveness and ineffectiveness of these responses have implications for culturally specific resistance skills training for these youth. Effective responses can be translated to effective resistance skills for these youth, while ineffective responses can be used to illustrate the responses that youth should avoid in drug-related problem situations. Specifically, the judgments of competence of each response must be made by a selection of “significant others” in the environment (e.g., community leaders, teachers, and helping professionals). These are individuals who have frequent contact with the population being studied, have a role in labeling or judging them as effective or ineffective in the environment, and whose opinions are likely to be respected by others. The judges are provided with a general definition of social competence as a guide, but are encouraged to use their own judgment. Judges use the same standards regarding effective behavior that would be used in a naturalistic setting. Ratings for each response are based on a 5-point Likert scale (5 = most competent and 1 = least competent) and are ranked according to their mean scores. For each problem situation, responses that are ranked in the highest quartile are determined to be highly competent, and those in the lowest quartile are determined to be highly incompetent. Responses in the middle two quartiles are considered neutral (e.g., perhaps addressing the presenting problem without escalating it or solving it). Judges also are asked to provide their specific criteria for a competent and incompetent rating for each response to a problem

situation. At the conclusion of this stage, an inventory of the most discriminating items for measuring social competence of drug resistance is created, which can be used in the development and evaluation of prevention programs specific to American Indian youth.

Implications for Primary Prevention

Far too often, prevention programs are attempted without sufficient knowledge of the salient environmental variables. Implicitly, this paper argues that more attention is necessary in the "pre-prevention" stages of research in order to develop effective prevention interventions for youth in general, and with Indigenous youth in particular. However, developing and evaluating prevention programs based on ecological models pose particular challenges in accurately assessing the multitude of ecological variables. In addition to intrapersonal determinants of health behavior and outcomes, the various facets of an individual's social network, organizations, communities, and public policies also must be considered (Richard, Potvin, Kishchuk, Prlic, & Green, 1996). This paper describes one approach toward conducting an ecological assessment using a combination of qualitative and quantitative methodologies.

Specifically, the early stages of the pilot study were broad and exploratory in nature, examining contextual factors of American Indian youth using a large, quantitative data set and a series of gender-specific focus groups. These stages of the Pilot were necessary to uncover the most important environmental factors contributing to drug use with American Indian youth. From this information, aspects of the context were operationalized into discrete drug related problem scenarios, allowing the range of responses, ranked by social competence, to be developed for each scenario. This process created concrete social situations involving drugs and alcohol, which could serve as the foundation for drug prevention curriculum components for American Indian youth. Factors related to the drug offerer, drugs used, time, and location inform culturally grounded "settings" for prevention interventions with these youth.

The American Indian Youth Pilot's model of ecological assessment is consistent with Biglan's (2004) concept of *functional contextualism*, which has as its goal the prediction and influence of behavior through identifying the most influential environmental variables. In the case of assessment from the American Indian Youth Pilot project, the relationship of the offerer to the youth is the most important unit of analysis. The relational context of drug use for American Indian adolescents appears to be the most salient aspect of their ecosystem, influencing their decisions to use drugs or resist drug offers. This meso-level construct is where prevention programs may affect the most change with these youth. In other words, this important information could be used in the creation of culturally grounded drug prevention programs for these youth.

Since the outcomes of each stage of the Pilot build upon each other, they most likely provide the strongest foundation for primary prevention efforts when conducted in serial order. For example, the outcomes of Stage 1 (Survey Data Analysis) provided some conceptual and theoretical direction toward the development of the focus group interview schedule used in Stage 2 (Assessing Environmental Demands). The need for all stages may be dependent on the scope of the planned prevention effort (e.g., within a school versus an entire school district) and the characteristics of the community (e.g., rural, urban, or reservation community). Broad survey data may not be necessary for prevention efforts within smaller communities, for example. Nonetheless, understanding the specific ecological and cultural correlates for community problems such as drug use is important for the development of effective prevention programs, and this paper illustrates one model toward understanding these correlates.

One example of an effective, culturally grounded drug prevention program for minority youth illustrates the potential for ecological assessment to inform prevention interventions. The *keepin' it R.E.A.L.* program (Gosin, Marsiglia, & Hecht, 2003), a school-based, drug prevention curriculum developed for Mexican American youth, evolved from an organic process similar to that of the American Indian Youth Pilot project. This program was developed through the use of interviews and focus groups with students and teachers. Interviews with youth focused on their real-world drug related experiences (Hecht, Alberts, & Miller-Rassulo, 1992), while focus groups with teachers were used to provide feedback on preliminary lessons of the curriculum (Gosin, Dustman, Drapeau, & Harthun, 2003). The outcome of this process was a drug prevention curriculum centered on the use of videotaped drug related problem scenarios that reflected the unique environments and situational demands of Mexican-American youth (Gosin, Dustman, et al., 2003).

The development of the *keepin' it R.E.A.L.* curriculum represents one successful model for translating ecologically-based research focused on the epidemiology and etiology of drug use into prevention practice. The information gained through ecologically based assessment included characteristics related to drug-related problem situations specific to Mexican-American youth, including types of substances used, the relationship of youth to the offerer, location(s) where drug offers typically occurred, and the time of day that these offers took place. This information was translated into video-based and role play scenarios that facilitated resistance skills training. Compared with generic or universal drug prevention programs chosen and instituted by schools or school district personnel in metropolitan Phoenix, the *keepin' it R.E.A.L.* program has been shown to be effective in decreasing gateway drug use, changing attitudes about drugs, and improving resistance strategies of a predominantly Mexican American sample in the Southwest (Hecht et al., 2003). Regarding client satisfaction, Harthun, Drapeau, Dustman, and Marsiglia (2002) highlighted positive teacher and student responses to the curriculum. For example, one student in their study stated "if somebody asks you if you want to do something with them that's bad, [the curriculum] tells you what to say so that they don't beat you up or something" (p. 360). Additionally, Gosin, Dustman et al. (2003) described the student receptivity to the curriculum, noting many instances when students asked "Are we having REAL class today?" and positive feedback from teachers regarding the curriculum. Specifically, teachers stated that they appreciated the chance to teach students culturally grounded tools to resist drug offers rather than a directive "standard message" about drugs. The evaluation of the curriculum suggests that prevention programs established through ecologically based research may yield stronger prevention effects for specific ethnic groups compared with programs that are used with these groups and are absent of this pre-prevention process.

However, recent research indicates limitations in using ecologically based assessment to inform culturally grounded prevention practice, in that prevention programs developed for non-Indigenous minority youth may not generalize to Indigenous youth populations. For example, while *keepin' it R.E.A.L.* has been shown to be effective in decreasing gateway drug use over time for Mexican American youth of the Southwest, it has also been shown to be limited in its effectiveness for American Indian youth within the same region. Dixon Rayle, Yabiku, Okamoto, Tann, and Burke (2005) examined the developmental trajectory of drug use over time for American Indian youth participating in the *keepin' it R.E.A.L.* program. They found that American Indian youth had a significantly steeper trajectory of marijuana and alcohol use from pre-intervention to one-year post-intervention compared with all other youth participating in the program. In other words, despite being a well-planned and implemented drug prevention effort for Mexican American youth, the program did not demonstrate any positive residual effects on the drug use of American Indian youth. These findings suggest that American Indian youth may need a culturally specific prevention curriculum tailored to their unique environmental contexts in order to address

their specific worldviews and behaviors. Rather than focusing on resistance skills that have been found to be effective for Mexican American youth (e.g., explaining why they do not want to use drugs), a curriculum for American Indian youth may need to focus on non-confrontational drug resistance strategies (e.g., redirecting the conversation away from drugs, avoiding situations where drug use is prevalent; Okamoto et al., 2001) and ways in dealing with specific drug offerers (e.g., adult family members, cousins, and peers). In sum, the research on *keepin' it R.E.A.L.* suggests two important findings: (1) Providing a foundation for prevention programs through the use of ecologically based assessment can have a considerable effect on the efficacy of these programs for specific ethnic groups, and (2) the process of translating research on ecologically based assessment into prevention practice needs to be culturally specific in order for this process to be effective.

Fidelity versus Fit

Translating ecologically-based research focused on epidemiology and etiology into prevention practice addresses two related, pressing issues facing prevention science: (1) the tension between fidelity and fit in prevention interventions for minority youth populations (Botvin, 2004; Castro, Barrera, & Martinez, 2004; Gottfredson & Gottfredson, 2002), and (2) evaluating shortcomings in existing prevention interventions.

Castro et al. (2004) described the dynamic tension in prevention science between the delivery of a manualized treatment in its purest form (program fidelity) and the delivery of a modified version of the program to meet the unique needs of a specific consumer group (program adaptation). The development of prevention interventions through ecological assessment merges these two constructs, such that the specific needs of a consumer group (e.g., American Indian youth) become a central part of the program from inception through implementation. This process eliminates the challenge of adapting universal prevention programs that may have been originally developed and normed on Caucasian youth to the cultural contexts of minority youth populations. Castro et al. (2004) outlined 12 steps to adapt universal prevention programs to the cultural contexts of minority youth populations, including assessing community concerns and needed resources, and defining the fidelity/adaptation balance. Additionally, there are issues related to program content and program delivery that also need to be considered in the adaptation process. By developing programs from the "ground up," such as through an ecological assessment, many of these concerns may be mitigated.

Further, using ecological perspectives as a theoretical framework for the evaluation of existing programs can lend insight into shortcomings found in universally implemented programs. For example, D.A.R.E. has been shown to be ineffective in numerous studies (e.g., Clayton, Cattarello, & Johnstone, 1996; Ennett, Tobler, Ringwalt, & Flewelling, 1994), in part because the program is largely removed from the relevant cultural contexts of the youth. An ecologically based assessment of the youths' social and cultural contexts can be used to identify the areas in program content or program delivery that might need to be modified, so that they reflect the realities of Indigenous youth more closely. Some research has shown that the closer prevention interventions mirror the cultural realities of targeted youth, the stronger the effects of the program (Hecht et al., 2003). An ecologically based assessment can be used to reveal the limits of the effectiveness of universal prevention intervention programs across cultures, and can provide a blueprint in how to tailor these interventions to the cultural realities of Indigenous youth populations.

Community Readiness

Finally, and perhaps most importantly, an ecological assessment has the beneficial side effect of gauging the receptivity of the community to prevention efforts with a specific

Indigenous youth population. This is perhaps the most critical aspect of an ecological assessment conducted with Indigenous populations due to their unique social structure, which is often reflective of long-standing tribal/communal norms and values. Without the knowledge of community acceptance and readiness to participate in the program development process, a successful prevention intervention may not be implemented successfully.

An ecological assessment is a method of integrating research and practice (Biglan, 2004), particularly in the area of community implementation and planning of prevention interventions. It enables the customized development of prevention interventions that reflect the unique needs of the community. Ideally, this is achieved with the community participating as an integral partner. The participatory nature of program development is a primary component of "culturally grounded" prevention science (Gosin, Dustman, et al., 2003). It is particularly important, as Indigenous communities are increasingly specifying their own criteria for the conduct of research and program implementation involving their tribal members. For example, the Mohawk Nation in upstate New York has developed a protocol for reviewing and approving research proposals that blends cultural philosophy, including inherent perspectives on collectivism, and pragmatic responses to operational issues and concerns (Akwesasne Task Force, 1996). Central to their review process is the requirement that community participation in all stages of research from assessment and planning to evaluation and dissemination be ensured. The intent of the Mohawk Nation was to develop a "guide to improve relations between the community of Akwesasne (Mohawk) and scientists/researchers, and to promote collaboration within the framework of mutual trust and cooperation" (Akwesasne Task Force, 1996, p. 38).

Barriers to Implementation

While an ecologically based assessment may have benefits related to the fidelity and fit of prevention interventions and gauging community receptivity toward prevention efforts, there are barriers related to the implementation of this process. With Indigenous populations, there exists a high degree of distrust towards researchers and practitioners outside of the community (Hawkins et al., 2004). Marlatt et al. (2003) described how this distrust affected their implementation and evaluation of a culturally specific life skills program for Northwestern American Indian youth. Specifically, they described challenges related to recruiting youth for participation in their program and gaining youth and community input on assessments and intervention materials. Similar challenges may exist in the implementation of the proposed approach toward ecologically based assessment. Nevertheless, overcoming issues related to trust is critical toward the validity of ecological assessments and the development of culturally relevant prevention programs for Indigenous youth.

Additionally, Biglan (2004) described scientific challenges related to ecological assessment. For example, he stated that statistical techniques for analyzing functional relationships in individual cases are underdeveloped. Further, he suggested that research related to ecological assessment is still relatively underemphasized by federal funding streams. Nonetheless, he also emphasized the importance of this type of assessment and its implications toward the cultural validity of prevention interventions.

CONCLUSIONS

This paper describes one approach towards ecological assessment and how it might be used to inform prevention interventions for Indigenous youth populations. Based on the research reviewed in this paper, two culturally grounded, school based prevention interventions for American Indian youth are currently under development (Tann, LeCroy, Dixon Rayle, &

Okamoto, 2005a, 2005b), and formal tests of the effectiveness of these approaches are forthcoming. The results from these evaluations will contribute to the growing body of research on drug prevention programs for both Indigenous and minority youth populations. As programs such as these have demonstrated, an ecological assessment appears to provide the foundation for culturally grounded prevention practices for Indigenous youth populations, enhancing the social and ecological validity of those interventions. Translating ecological assessment into prevention interventions builds aspects of the youths' social ecology deep into the structure of the intervention, merging the often-competing demands of fidelity and fit of interventions. While the approach toward developing prevention interventions may take more planning and may be more time consuming, it may also focus the interventions on the most relevant social and environmental factors for these youth. Furthermore, with the participation of Indigenous populations in the primary stages of program development, the social acceptability of the process is increased, promoting the likelihood of a successful prevention effort.

Acknowledgments

This study was supported by National Institutes of Health/National Institute on Drug Abuse funding for the Southwest Interdisciplinary Research Center at Arizona State University (R-24 DA 13937-01) and seed funding from the Office of the Vice President for Research and the College of Public Programs at Arizona State University.

References

Akwesasne Task Force on the Environment, Research Advisory Committee. Protocol for review of environmental and scientific research proposals. Hogansburg, NY: Akwesasne Task Force on the Environment, Research Advisory Committee; 1996.

Austin AA. Alcohol, tobacco, other drug use, and violent behavior among Native Hawaiians: Ethnic pride and resilience. Substance Use and Misuse 2004;39(5):721–746. [PubMed: 15202806]

Botvin G. Advancing prevention science and practice: Challenges, critical issues, and future directions. Prevention Science 2004;5:69–72. [PubMed: 15058915]

Bronfenbrenner, U. Ecological systems theory. In: Vasta, R., editor. Six theories of child development: Revised formulations and current issues. London: Jessica Kingsley; 1992. p. 187-250.

Biglan A. Contextualism and the development of effective prevention practices. Prevention Science 2004;5(1):15–21. [PubMed: 15058908]

Bureau of Indian Affairs. Indian entities recognized and eligible to receive services from the United States Bureau of Indian Affairs. Federal Register 2003;68:68180–68184.

Castro FG, Barrera M, Martinez CR. The cultural adaptation of prevention interventions: Resolving tensions between fidelity and fit. Prevention Science 2004;5(1):41–45. [PubMed: 15058911]

Clayton RR, Cattarello AM, Johnstone BM. The effectiveness of Drug Abuse Resistance Education (Project DARE): 5-year follow-up results. Preventive Medicine 1996;25(3):307–318. [PubMed: 8781009]

Dixon Rayle A, Kulis S, Okamoto SK, Tann SS, LeCroy CW, Dustman P, et al. Who is offering and how often? Gender differences in drug offers among American Indian adolescents of the Southwest. Journal of Early Adolescence. (in press).

Dixon Rayle, A.; Yabiku, ST.; Okamoto, SK.; Tann, SS.; Burke, AM. The effectiveness of a multicultural school-based drug prevention curriculum with American Indian youth. 2005. Manuscript submitted for publication

Ennett ST, Tobler NS, Ringwalt CL, Flewelling RL. How effective is Drug Abuse Resistance Education? A meta-analysis of Project DARE outcome evaluations. American Journal of Public Health 1994;84(9):1394–1401. [PubMed: 8092361]

Gibbs, JT.; Huang, LN. A conceptual framework for assessing and treating minority youth. In: Gibbs, JT.; Huang, LN., editors. Children of color: Psychological interventions with minority youth. 2. San Francisco: Jossey-Bass; 1998. p. 1-29.

Goebert DA, Bell CK, Hishinuma ES, Nahulu LB, Johnson RC, Foster J, et al. Influence of family adversity on school-related behavioural problems among multi-ethnic high school students. School Psychology International 2004;25(2):193–206.

Goebert D, Nahulu L, Hishinuma E, Bell C, Yuen N, Carlton B, et al. Cumulative effect of family environment on psychiatric symptomatology among multiethnic adolescents. Journal of Adolescent Health 2000;27:34–42. [PubMed: 10867350]

Goldfried, MR.; D'Zurilla, TJ. A behavioral-analytic model for assessing competence. In: Spielberger, CD., editor. Current topics in clinical and community psychology. New York: Academic Press; 1969. p. 151-196.

Gosin MN, Dustman PA, Drapeau AE, Harthun ML. Participatory action research: Creating an effective prevention curriculum for adolescents in the Southwestern U.S. Health Education Research 2003;18(3):363–379. [PubMed: 12828237]

Gosin M, Marsiglia FF, Hecht ML. *keepin' it R.E.A.L.*: A drug resistance curriculum tailored to the strengths and needs of pre-adolescents of the southwest. Journal of Drug Education 2003;33:119–142. [PubMed: 12929705]

Gottfredson DC, Gottfredson GD. Quality of school based prevention programs: Results from a national survey. Journal of Research on Crime and Delinquency 2002;39:3–35.

Green LW, Richard L, Potvin L. Ecological foundations of health promotion. American Journal of Health Promotion 1996;10(4):270–281. [PubMed: 10159708]

Greenfield, PM. Independence and interdependence as developmental scripts: Implications for theory, research, and practice. In: Greenfield, PM.; Cocking, RR., editors. Cross-cultural roots of minority child development. Hillsdale, NJ: Lawrence Erlbaum; 1994. p. 1-37.

Harthun ML, Drapeau AE, Dustman PA, Marsiglia FF. Implementing a prevention curriculum: An effective research-teacher partnership. Education and Urban Society 2002;34(3):353–364.

Hawkins EH, Cummins LH, Marlatt GA. Preventing substance abuse in American Indian and Alaska Native youth: Promising strategies for healthier communities. Psychological Bulletin 2004;130(2): 304–323. [PubMed: 14979774]

Hecht ML, Alberts JK, Miller-Rassulo M. Resistance to drug offers among college students. International Journal of Addictions 1992;27:995–1017.

Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, et al. Culturally grounded substance use prevention: An evaluation of the *keepin' it R.E.A.L.* curriculum. Prevention Science 2003;4(4):233–248. [PubMed: 14598996]

Hiday VA. The social context of mental illness and violence. Journal of Health and Social Behavior 1995;36(2):122–137. [PubMed: 9113138]

Hurdle DE, Okamoto SK, Miles B. Family influences on alcohol and drug use by American Indian youth: Implications for prevention. Journal of Family Social Work 2003;7(1):53–68.

Kulis S, Napoli M, Marsiglia FF. Ethnic pride, biculturalism, and drug use norms of urban American Indian adolescents. Social Work Research 2002;26(2):101–112.

Kulis S, Okamoto SK, Dixon Rayle A, Nyakoe S. Social contexts of drug offers among American Indian youth and their relationship to drug use: An exploratory study. Cultural Diversity and Ethnic Minority Psychology. (in press).

Link BG, Phelan J. Social conditions as fundamental causes of disease. Journal of Health and Social Behavior 1995;35(Extra Issue):80–94. [PubMed: 7560851]

Makini GK, Hishinuma ES, Kim P, Carlton BS, Miyamoto RH, Nahulu LB, et al. Risk and protective factors related to Native Hawaiian adolescent alcohol use. Alcohol and Alcoholism 2001;36:235–242. [PubMed: 11373261]

Marlatt GA, Larimer ME, Mail PD, Hawkins EH, Cummins LH, Blume AW, et al. Journeys of the Circle: A culturally congruent life skills intervention for adolescent Indian drinking. Alcoholism: Clinical and Experimental Research 2003;27(8):1–3.

Miike, L. Health and related services for Native Hawaiian adolescents. In: Kagawa-Singer, M.; Katz, PA.; Taylor, DA.; Vanderryn, JHM., editors. Health issues for minority adolescents. Lincoln, NE: University of Nebraska Press; 1996. p. 168-187.

Moncher MS, Holden GW, Trimble JE. Substance abuse among Native-American youth. Journal of Consulting and Clinical Psychology 1990;58:408–415. [PubMed: 2212177]

Morse, WC. Ecological approaches. In: Kratochwill, TR.; Morris, RJ., editors. Handbook of psychotherapy with children and adolescents. Boston: Allyn and Bacon; 1993. p. 320-355.

Napoli M, Marsiglia FF, Kulis S. Sense of belonging in school as a protective factor against drug abuse among Native American urban adolescents. Journal of Social Work Practice in the Addictions 2003;3(2):25–41.

Okamoto SK, Hurdle DE, Marsiglia FF. Exploring culturally-based drug resistance strategies used by American Indian adolescents of the Southwest. Journal of Alcohol and Drug Education 2001;47(1):45–59.

Okamoto SK, LeCroy CW, Dustman P, Hohmann-Marriott B, Kulis S. An ecological assessment of drug related problem situations for American Indian adolescents of the Southwest. Journal of Social Work Practice in the Addictions 2004;4(3):47–63.

Richard L, Potvin L, Kishchuk N, Prlic H, Green LW. Assessment of the integration of the ecological approach in health promotion programs. American Journal of Health Promotion 1996;10(4):318–328. [PubMed: 10159711]

Rogoff, B. Apprenticeship in thinking: Cognitive development in social context. New York: Oxford University Press; 1990.

Schinke SP, Tepavac L, Cole KC. Preventing substance use among Native American youth: Three-year results. Addictive Behaviors 2000;25:387–397. [PubMed: 10890292]

Stokols D. Translating social ecological theory into guidelines for community health promotion. American Journal of Health Promotion 1996;10(4):282–298. [PubMed: 10159709]

Tann, SS.; LeCroy, CW.; Dixon Rayle, A.; Okamoto, SK. Unpublished manuscript. Arizona State University; 2005a. Culturally specific drug abuse prevention for American Indian youth.

Tann, SS.; LeCroy, CW.; Dixon Rayle, A.; Okamoto, SK. Media based substance abuse prevention for American Indian youth. In: Marsiglia, FF., editor. SIRC health disparities research: Cultural processes in risk and resiliency (NIH Export Center). Arizona State University; 2005b. p. 176-240. (P.I.)Unpublished manuscript

Trotter RT, Rolf JE, Baldwin JA. Cultural models of inhalant abuse among Navajo youth. Drugs and Society 1997;10(1–2):39–59.

Vygotsky, LS. Mind in society. London: Harvard University Press; 1978.

Waller MA, Okamoto SK, Miles BW, Hurdle DE. Resiliency factors related to substance use/resistance: Perceptions of Native adolescents of the Southwest. Journal of Sociology & Social Welfare 2003;30(4):79–94.

Zimmerman MA, Ramirez-Valles J, Washienko KM, Walter B, Dyer S. The development of a measure of enculturation for Native American youth. American Journal of Community Psychology 1996;24(2):295–310. [PubMed: 8795263]

Table I

Representative Problem Situations

Situation 56	You go home after school and your mom and dad are at home with a couple of friends and they have been drinking and are pretty messed up. They give you some liquor and say you need to learn how to hold your own
Situation 24	Your aunt and uncle have an extra pack of cigarettes and they offer it to you
Situation 31	All the cousins are together and one of the older ones passes a joint of marijuana around the group, calling everyone names who doesn't want to take a hit
Situation 48	You've been driving around with your friend and now you're parked out in the middle of nowhere. Your friend pulls out some hard drugs from behind the seat and asks you if you want some
Situation 44	It's Saturday night and you are at a party with some friends. There is a lot of music and many people of all ages are drinking and smoking. Your friend comes over to you with this person you don't know, who offers you a joint of marijuana