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The Development and Initial Validation of the Hawaiian Youth Drug Offers Survey (HYDOS)

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Abstract

This study describes the development and preliminary validation of a survey focused on the most salient situations where drugs and/or alcohol are offered to Native Hawaiian youth in rural communities. The study used a 5-phase approach to test development and validation. In Phase 1 (Item Generation), survey items were created from a series of focus groups with middle school aged youth ($N = 47$). In Phase 2 (Item Refinement and Selection), items were edited and reduced to 62 drug offer situations that were selected for inclusion in the survey. In Phase 3 (Item Reduction), items were administered to 249 youth from 7 middle or intermediate schools in Hawai'i. Exploratory factor analysis of the Native Hawaiian subsample ($n = 194$) indicated the presence of three factors accounting for 63% of the variance: Peer Pressure (23%), Family Offers and Context (21%), and Unanticipated Drug Offers (19%). The survey items differentiated between Hawaiian and non-Hawaiian youth respondents, supporting the validity of the questionnaire. The hypothesized relationship between cultural connectedness and drug offer exposure was not confirmed. Internal consistency of the measure was high.

Keywords

Test development; validity; Native Hawaiian; youth; drugs

In recent years, there has been an increased emphasis on large scale drug prevention programs with minority youth populations. Much of this research has focused on Latino (Hecht et al., 2003), African American (Brody et al., 2006), and American Indian (Moran & Bussey, 2007) youth, and has emphasized “grounding” the prevention skills and messages into the specific cultural contexts of the youth participants. To date, there have been no comparable culturally grounded prevention programs focused on Pacific Islander youth

populations, creating a large gap in the drug prevention and health disparities literatures. More importantly, communities concentrated with these youth have few options for selecting and implementing culturally appropriate and effective drug prevention programs (Rehuher, Hiramatsu, & Helm, 2008).

The purpose of this study is to develop a survey focused on the most salient situations where drugs and/or alcohol are offered to Native Hawaiian youth in rural communities, and to provide preliminary evidence toward the validation of the survey. Using a 5-phase procedure for test development and validation (Okamoto, 2001), the outcome of this study is a culturally “grounded” instrument which identifies the dimensions of drug offers for these youth. The survey has implications for both the development and assessment of prevention programs for rural Hawaiian youth, and provides an increased understanding of the environmental, social, and cultural context of drug use for these youth.

Native Hawaiian Youth and Drug Use

Epidemiological research has indicated early initiation and high rates of drug and alcohol use for Native Hawaiian youth. Compared to White and other Asian Pacific Islander youths in Hawai‘i, a higher proportion of Native Hawaiian youth initiated drinking by age 12 and/or were more likely to engage in episodic drinking (Ramisetty-Mikler, Caetano, Goebert, & Nishimura, 2004). High rates of gateway drug use for Native Hawaiian youth have also been described in the research literature (Wong, Klinge, & Price, 2004; Glanz, Maskarinec, & Carlin, 2005; Glanz, Mau, Steffen, Maskarinec, & Arriola, 2007), and are particularly pronounced in rural areas of Hawai‘i (Lai & Saka, 2005). In a study examining the most salient factors impacting rural health in Hawai‘i, “drug use” was the second most common factor cited by community stakeholders within the sampled regions (Withy, Andaya, Mikami, & Yamada, 2007). Compared with other youth ethnic populations in Hawai‘i, Hawaiian youth reported the highest need for substance abuse help or treatment (Wong et al., 2004), and higher rates of unsafe sexual practices and suicidal behavior influenced by substance abuse (Ramisetty-Mikler et al., 2004; Yuen, Nahulu, Hishinuma, & Miyamoto, 2000). Although much of the research indicates that drug use and abuse is a major health issue for Hawaiian youth, several studies on Hawaiian and other indigenous youth populations have suggested that ethnic pride or cultural connectedness may be a protective factor against drug use (Kulis, Napoli, & Marsiglia, 2002; Po‘a-Kekuawela, Okamoto, Nebre, Helm, & Chin, in press). Further, while more is known about the extent of drug use for Hawaiian youth, little is still known about the causal factors related to drug and alcohol initiation and use.

Measurement of Culture and Drug Use

Measurement of illicit drug use with minority youth populations has been described in the literature predominantly through large scale prevalence studies. For example, questionnaire data from the Monitoring the Future study (Delva et al., 2005; Wallace et al., 2002; Wallace et al., 2003) and the Youth Risk Behavior Survey (Everett & Warren, 2001) have been used to examine the rates and trends of drug use across time for selected ethnic group populations. Wallace et al. (2003) examined the drug use patterns of seven ethnic groupings: White, Black, Mexican American, Puerto Rican, Other Latin American, Asian American, and American Indian. In their analysis, it is unclear where Pacific Islanders (including Native Hawaiians) were categorized, and they include a methodological caveat in describing their measures—“The authors recognize that each of the ethnic and racial categories are diverse, and treating them as homogenous groups may mask the important within- and between-ethnic group differences” (p. 227). The practice of categorizing Pacific Islanders into larger ethnic groupings has particularly affected research on Native Hawaiians (Mokuau, Garlock-Tuiali‘i, & Lee, 2008) and has been described as conceptually

problematic for research with similar populations (Mayeda & Okamoto, 2002). Indicative of many of the measurement tools used in large scale studies of minority youth populations is that they provide ample breadth, but lack the depth and specificity necessary to understand the complexity of drug using behavior for many of these youth.

Culturally Based Test Development and Validation

As a contrast to the measurement tools used in large scale prevalence studies, there have been examples in the research literature of efforts to develop culturally specific instruments to assess a variety of phenomena or behaviors. Two models have been primarily used in the development of these instruments—(1) Culturally “grounded” test development methods, and (2) culturally “adapted” test development methods.

Culturally “Grounded” Test Development—Studies which have focused on culturally “grounded” methods in test development typically begin with the use of qualitative methods in order to develop survey items. For example, Allen et al. (2006) conducted interviews related to alcohol sobriety with Alaskan Native adults, in order to identify survey items focused on protective factors for alcohol use with the population. Similarly, Okamoto, LeCroy, Dustman, Hohmann-Marriott, and Kulis (2004) utilized focus groups to identify drug related problem situations for urban American Indian youth of the southwest U.S. These situations served as the foundation for survey items focused on drug offers for these youth. Similar methods have been used in the development of items related to Hawaiian acculturation (Rezentes, 1993; Hishinuma et al., 2000) and stress measurement of Mexican immigrant farmworkers (Snipes, Thompson, O’Connor, Godina, & Ibarra, 2007). Characteristic of all of these studies is that they focus on under-researched populations and/or phenomena. The participants’ narratives evolving from qualitative methods, rather than the theoretical and empirical literatures on these populations, guide the development and construction of survey items. As such, the qualitative phases of these studies are “discovery oriented,” and serve as the foundation for later stages of the test development process (Allen et al., 2006).

Culturally “Adapted” Test Development—Studies have also adapted survey items from the theoretical and/or empirical literatures in order to create culturally specific measures. These studies generally fall into two categories—(1) studies in which survey items have been developed from theory, and (2) studies in which survey items have been adapted from existing measures. As an example of the former, Roberts et al. (1999) developed items for the Multigroup Ethnic Identity Measure (MEIM) based on Erikson’s developmental theory and social identity theory, which were subsequently validated on a large sample of predominantly Mexican American, African American, and White youth. Similarly, Glanz and colleagues used Antonovsky’s salutogenic model of health behavior to guide their development of survey items focused on Hawaiian youths’ attitudes toward tobacco use (Glanz et al., 2005, 2007).

Several studies have also created culturally specific measures by adapting existing validated measures. For example, Glanz et al. (2007) adapted items from the MEIM as part of their evaluation of tobacco use of Hawaiian youth. In several cases, the cultural adaptation of measures has occurred in collaboration with ethnic communities. For example, Austin (2004) utilized a modified version of the National Household Survey on Alcohol and Other Drug Use in order to evaluate substance use and violent behavior among Native Hawaiians. The modified version, entitled the Pacific Islander Epidemiological Survey, was developed in collaboration with health, social welfare, and academic professionals from various Pacific Island nations (e.g., Hawai‘i, American Samoa, Micronesia). Similarly, Zimmerman, Ramirez-Valles, Washienko, Walter, and Dyer (1996) collaborated with Tribal staff who

worked with American Indian youth in order to develop a Native enculturation scale based on items from existing measures. In sum, culturally “adapted” measures rely on the foundation of prior empirical research in order to develop valid survey items. Because of this, survey items can be created with limited primary data or information from the targeted population, although several examples exist in the literature of survey adaptations in collaboration with communities.

Relevance of the Study

This study builds upon the literature in culturally-based test development and validation, while providing the depth and specificity in measurement that is lacking from large scale drug use prevalence studies. Because this study focuses on drug offers, it describes the antecedents or precursors to drug initiation and use for Native Hawaiian youth in rural communities. As such, it provides specific information early in the sequelae of youth drug use and abuse which could be used to interrupt the progression of the disorder. Further, this study builds upon related test development research with Native youth populations (Okamoto et al., 2004). While Okamoto et al. operationalized drug offer situations for American Indian youth of the Southwest similar to the present study, their study lacked statistical power and was unable to validate the cultural specificity of their measure, due to the lack of non-Native youth in their sample. This study addresses these issues, in order to establish a Hawaiian-specific measurement tool which could be used for assessment or evaluation purposes.

Method

Due to the lack of research focused on the etiology of drug use for Native Hawaiian youth (Mokuau et al., 2008), this study utilized a culturally “grounded” approach to test development and validation similar to prior research (e.g. Allen et al., 2006). Qualitative methods were used in the early phases of the research to create survey items, while quantitative methods were used in the later stages to validate these items. All research procedures were approved by the Institutional Review Boards at Hawai‘i Pacific University, University of Hawai‘i at Mānoa, and the Hawai‘i Department of Education.

Phase 1: Item Generation

The goal of this phase was to generate a large, representative pool of potential survey items related to drug offers made toward Native Hawaiian youth in rural communities. Items were created from the narratives of middle school aged youth participating in 14 small, gender-specific focus groups ($N = 47$). These groups were conducted in 4 different middle schools on the Big Island of Hawai‘i and in one pilot study school from another island, with the purpose of elucidating the social context of drug offers for these youth. Participants described situations in which drugs had been offered to them or someone they knew, and shared their views on the extent of the drug problem in their school or community and what could be done about it (See Helm et al., 2008; Po‘a-Kekuawela et al., in press, for further elaboration of the focus group procedure). Transcripts from all of the groups were coded to identify common and difficult drug offer situations described by youth participants. In order for other youth to be able to relate to the items, particular attention was given to incorporating the specific language and phrasing of the group participants into each of the items created from this stage of the study. This process yielded a total of 127 survey items from the focus group transcripts.

Phase 2: Item Refinement and Selection

The goals of this phase were to reduce the total number of situations to be included on the survey and to establish two measures for each item: (1) the *frequency* in which youth were

exposed to each situation, and (2) the perceived *difficulty* in refusing drugs in each situation. The total number of situations was reduced by eliminating redundant, non-representative, and vague items, and combining similar situations described by youth participants. Offers which were too specific or appeared random in nature were eliminated. For example, one offer that was eliminated focused on a stranger at a bus stop who offered a youth some “pills.” No other youth in the focus groups described drug offers by strangers or with prescription drugs; therefore the situation was deemed “non-representative” and was eliminated from the list of viable items. Other non-representative items that were eliminated appeared too specific in detail and description. If separate items shared common aspects, such as similar settings or activities, one of the situations was deleted or they were combined into one item, as long as the integrity of the situation (e.g., language, location, and/or offerer in the situation.) was not compromised from either of the items.

This process produced a final list of 62 problem situations (see Table 1 for a full list of problem situations). Twenty-nine percent of the situations described a friend as the primary drug offerer, while 23% described a cousin and 19% described a peer as the drug offerer. Forty-three percent of the situations described marijuana as the primary offered substance, while 32% described alcohol and 11% described cigarettes as the primary offered substance. Thirty-six percent described drug offers in the community setting, while 32% and 27% described them within a family and school setting, respectively. Finally, 79% of the drug offers were considered “direct” (i.e., didactic exchanges where an offer is made), and 21% were considered “indirect” (i.e., complex social situations where there is an implicit expectation to use drugs). Students were instructed to use two Likert scales to respond to each item—one that rated the lifetime frequency of experiencing the situation, ranging from 0 (“never”) to 4 (“more than 10 times”), and the other that rated the difficulty of refusing drugs in the situation, ranging from 0 (“very easy”) to 4 (“very difficult”).

Phase 3: Item Reduction

Participants—Two hundred and forty nine youth from 7 different middle or intermediate schools on the Big Island of Hawai‘i completed the Phase 2 survey. These youth were sampled from the same regions as the youth participating in Phase 1 of the study. Participating schools were geographically focused within two of the three complex areas in the Department of Education on the Big Island of Hawai‘i, and represented 47% of all middle or intermediate public schools on the island. Within each school, a designated staff member, such as a school counselor or teacher, assisted the researchers in recruiting students, distributing and collecting parental consent and student assent forms, and securing space for survey administration. Within the sample, 59% of the respondents were female, and the mean age was 11.87 years ($SD = .860$). One hundred and ninety four of the youth either self identified or were documented in school records as Native Hawaiian. Consistent with the mixed ethnicity of most Native Hawaiians in Hawai‘i, 26% of these youth also identified with another ethnic group (e.g., Japanese, White, or Filipino). Fifty-five youth in the sample self identified exclusively with an ethnicity other than Native Hawaiian. Of these youth, 44% identified as Filipino, followed by other Pacific Islander (15%), and White (13%). Twenty-five percent of the youth were in 6th grade, 47% were in 7th grade, and 27% were in 8th grade. Seventy-one percent of the respondents received either a free or reduced cost school lunch. This amount was higher than the mean for all schools participating in the study ($M = 58\%$, $SD = 10.3$; Accountability Resource Center Hawai‘i, 2007). There was no significant difference in receipt of free or reduced cost lunch between Native Hawaiian and Non-Hawaiian subsamples in the study.

Exploratory Factor Analysis—A correlation matrix of questionnaire items was completed to examine relationships among items. Principal axis factoring with promax

rotation was conducted with the subsample of Native Hawaiian youth ($n = 194$) in order to identify and validate latent constructs. Use of the common factor model rather than principal components analysis was selected to control for the influences of specific variance and error variance on the factor structure. An oblique, versus orthogonal, rotation was selected based on the predicted correlation between potential factors.

The number of factors was determined using a scree plot. Scree plots consist of the magnitude of eigenvalues as a function of their ordinal position (Nunnally & Bernstein, 1994), and using them to determine the number of retained factors in exploratory factor analysis is preferred over other methods (Osborne & Costello, 2005). Because the primary criticism of the use of the scree plot is its reliance on subjectivity (Gorsuch, 1983), several plausible factor solutions were proposed and analyzed based on the scree test in order to determine the most interpretable solution.

Phase 4: Reliability

Internal consistency was assessed with Cronbach's alphas for each of the subscales derived from the factor analysis.

Phase 5: Validity

In order to test the construct validity of the measure, two hypotheses were proposed and tested.

Hypothesis 1—Compared with non Hawaiian youth, Hawaiian youth should be exposed more frequently to the drug offer situations on the HYDOS.

Because the survey items were developed from focus groups of Hawaiian youth, responses should differentiate these youth from their non-Hawaiian counterparts.

Hypothesis 2—Hawaiian youth with higher cultural connectedness should have less exposure to drug offers than those with lower levels of cultural connectedness.

Based on literature which suggests that ethnic pride or enculturation is a protective factor for Native youth populations (Kulis et al., 2002; Po'a-Kekuawela et al., in press), it would follow that youth respondents with higher levels of cultural connectedness would be exposed less frequently to drug offers than those that were not connected to the Hawaiian culture. Participants in the study responded to the Activities & Social Events subscale of the Hawaiian Culture Scale—Adolescent Version (Hishinuma et al., 2000), which is used to gauge cultural connectedness in the Hawaiian youth population. Participants also responded to a separate question from the Hawaiian Culture Scale (How important is it to you to maintain Hawaiian cultural traditions?).

Results

Phase 3: Item Reduction

Descriptive Statistics—For the frequency scale, mean scores for the 62 items ranged from .04 (items 42 and 48) to .58 (item 19) for the full sample. For the Native Hawaiian subsample, mean frequency scores ranged from .05 (items 42 and 48) to .69 (item 19). The distribution of item frequency scores was positively skewed for both the full sample and Native Hawaiian subsample. The median frequency score for the full sample and Native Hawaiian subsample was "0" for all items. For the full sample, the percentage of respondents who answered "1" or above for each item (indicating exposure to the situation) ranged from 1.21 (item 48) to 27.80 (item 19). Three of the items had over 20% of the

respondents answer “1” or above (items 10, 17, and 19). For the Native Hawaiian subsample, the percentage of respondents who answered “1” or above for each item ranged from 1.60 (item 48) to 31.40 (item 19). Eight of the items had over 20% of the respondents answer “1” or above (items 9, 10, 14, 17, 19, 22, 29, and 43).

For the difficulty scale, mean scores for the 62 items ranged from .80 (items 13 and 51) to 1.23 (item 25) for the full sample. For the Native Hawaiian subsample, mean difficulty scores ranged from .65 (item 13) to 1.13 (items 8 and 25). The distribution of difficulty scores was positively skewed for both the full sample and Native Hawaiian subsample. The median score for the full sample was “0” for all difficulty items, except for item 8 (median = 1). The median score for the Native Hawaiian subsample was “0” for all difficulty items.

Exploratory Factor Analysis—Sixty-two items of the Phase 2 survey were entered into an inter-item correlation matrix and were factor analyzed. The frequency and difficulty responses were analyzed separately. Inter-item correlation matrices for the frequency and difficulty scales indicated moderate to high correlations among all items for both the full sample and the Native Hawaiian subsample. Many of the items within these matrices had correlations ranging from .70 to .80. Scree plots for the frequency and difficulty scales were generated for the Native Hawaiian subsample. These plots were similar and each indicated a 2-, 3-, 4-, or 5-factor solution (see Figure 1 for the frequency scree plot). Among the various solutions for the frequency scale, the 3-factor solution generated factor loadings that were the most interpretable. Factor loadings for the difficulty scale were not interpretable based on options generated from the scree plot. Factors 1 through 3 from the frequency scale had eigenvalues of 34.25, 3.38, and 2.72, respectively. The 3-factor solution accounted for 63% of the common variance. Factors 1 through 3 accounted for 23%, 21%, and 19% of the variance, respectively. Variance explained by each factor was calculated using principal axis factoring with varimax rotation, as an orthogonal rotation method was necessary to calculate variance specific to each factor.

A factor solution was created by examining the difference between loadings for each item on each factor. Individual items with factor loadings of .45 or greater were retained for inclusion in each factor, except in the case of “crossloading” items (those which loaded on two or more factors), which were dropped from the analysis (Osborne & Costello, 2005). Table 2 lists the 24 retained items with their respective factor loadings and communality estimates. Factor 1 was comprised of 9 items that focused on peer pressure to use drugs and alcohol. Factor 2 was comprised of 9 items that focused on family drug offers or context. Factor 3 was comprised of 6 items that focused on unanticipated drug offers. These were offers that appeared sudden or unexpected, and had marijuana as the drug primarily offered in the situation.

The subscale scores for the HYDOS were calculated using the mean for items within each subscale. In order, the means for Subscales 1 through 3 were 0.29, 0.24, and 0.21 (*SDs* = 0.63, 0.54, and 0.59, respectively). The inter-subscale correlations derived from the three-factor solution are reported in Table 3. Correlations among subscales ranged from 0.63 (Subscales 2 and 3) to 0.76 (Subscales 1 and 3).

Phase 4: Reliability

As a measure of internal consistency, Cronbach’s alpha was calculated for each of the subscales derived from the HYDOS. Reliability coefficients were .93, .90, and .91 for Factors 1 through 3, respectively. For the Native Hawaiian subsample, Cronbach’s alpha for the Activities & Social Events subscale included in this survey was .86. This score was nearly equivalent to those reported for Hawaiian participants (.87) from the development and validation of the Hawaiian Culture Scale-Adolescent Version (Hishinuma et al., 2000).

Phase 5: Validity

Hypothesis 1—In order to examine if the drug offer situations on the HYDOS differentiated between Hawaiian and non-Hawaiian youth, two analyses were conducted. Table 4 lists the top 10 most frequently experienced situations from Native Hawaiian respondents, and compares them to the non-Hawaiian respondents. Compared with non-Hawaiian youth, independent samples t-tests revealed that Native Hawaiian/youth were exposed significantly more to 8 of the 10 situations. Similarly, Native Hawaiian participants were exposed significantly more to items on Subscale 1 (Peer Pressure), $t(226) = 3.45, p < .01$, Subscale 2 (Family), $t(239) = 4.14, p < .001$, and Subscale 3 (Unanticipated Drug Offers), $t(244) = 3.37, p < .01$, compared to their non-Hawaiian counterparts.

Hypothesis 2—Because of the correlation between the three subscales (see Table 3), semipartial correlations were calculated in order to examine the relationship between each of the three HYDOS subscales and the Activities & Social Events subscale from the Hawaiian Culture Scale-Adolescent Version, with the influence of the other two HYDOS subscales removed from the relationship. None of the predicted relationships were significant (Peer Pressure, $r = .093$; Family, $r = -.026$; Unanticipated Drug Offers, $r = .112$; all $ps > .05$). Similarly, semipartial correlations were calculated to examine the relationship between each of the three HYDOS subscales and the cultural traditions question from the Hawaiian Culture Scale-Adolescent Version. None of the predicted relationships were significant (Peer Pressure, $r = .027$; Family, $r = -.119$; Unanticipated Drug Offers, $r = .081$; all $ps > .05$).

Discussion

The primary focus of this study was to develop and validate a measure focused on drug offers of Native Hawaiian youth in rural communities. Multiple phases were used to address content, factor, and construct validity and reliability of the questionnaire. In Phases 1 and 2, items were generated through a series of focus groups with rural Hawaiian youth, and were edited to eliminate redundant or non-representative items. Phase 3 addressed the factor validity of the questionnaire. Three factors emerged from the analysis of the frequency scale: (1) Peer pressure, (2) Family Offers and Context, and (3) Unanticipated Drug Offers. The consistently high communality estimates of items on the survey (.776–.983) and high overdetermination of factors (6–9 items per factor with high factor loadings) suggested that the factor structure was stable and reflected the population factor pattern (MacCallum, Widaman, Zhang, & Hong, 1999). Phase 4 addressed the reliability of the subscales of the questionnaire. Cronbach's Alpha scores ranged from .90 to .93, indicating high internal consistency among items within factors (Nunnally & Bernstein, 1994). Finally, Phase 5 examined the construct validity of the survey. One of the two proposed hypotheses was supported, suggesting that the HYDOS differentiated between Hawaiian and non-Hawaiian youth.

Factors 1 and 2 validate prior research focused on drug offers and indigenous youth populations. In this study, Factor 1 consisted of 9 items which involved direct or indirect forms of peer pressure to use drugs. Factor 2 consisted of 9 items which included drug offers from family members or within a familial context. These findings are similar to those of Okamoto et al. (2004), which identified four different groupings of drug offers for American Indian youth of the southwest U.S. (peers, cousins, parents, and adult family members). The findings from the present study further support the notion that drug offers for Native youth populations have more to do with *who* is offering drugs, rather than the types of drugs being offered or where the drugs are being used (Kulis, Okamoto, Dixon Rayle, & Sen, 2006; Okamoto et al., 2004). In this sense, drug offers (and subsequently drug use) for Native

youth populations have a substantial relational aspect to them, and interventions for drug use should be tailored to explicitly address this cultural dimension.

Factor 3 consisted of 6 items where drug offers were unexpected in nature. These included situations where respondents were unfamiliar with the individual in the situation (e.g., someone you “just started dating” offers drugs), or were unfamiliar with their drug using history (e.g., a cousin who says “don’t tell my mom” and offers drugs). This finding suggests that Hawaiian youth in rural communities need the skills to cope with unexpected drug offers in their homes, schools, and communities. This might entail drug resistance skills training in awkward social situations with a variety of individuals and settings. Ideally, these skills would convey resistance without damaging the youth’s reputation in school or relationship with the drug offerer.

The hypotheses tested in this study demonstrated mixed findings. Hypothesis 1 examined whether rural Hawaiian youth were exposed more frequently to the drug offer situations than their non-Hawaiian counterparts. Mean comparisons for both the Hawaiian respondents’ 10 most frequent items and for the 3 subscales indicated that Hawaiian youth were exposed more frequently to the drug offer situations on the HYDOS. In fact, mean comparisons for 49 of the 62 items indicated significantly higher exposure for Hawaiian youth (results not presented). Because there were no significant differences in socioeconomic status between the Hawaiian and non-Hawaiian subsamples, and because both of these subsamples were drawn from the same schools, cultural differences (rather than socioeconomic or regional differences) most likely influenced the differential exposure to drug offer situations on the HYDOS. Hypothesis 2 examined the relationship of the Activities & Social Events subscale and the cultural significance question on the Hawaiian Culture Scale-Adolescent Version (Hishinuma et al., 2000) with the frequency of drug offers on the HYDOS subscales for Native Hawaiian youth. Neither of these analyses were significant. “Culture” has been described in the literature as a complex variable to measure (Oetting, Donnermeyer, Trimble, & Beauvais, 1998). More specifically, Oetting et al. state that behaviors such as drug use may be influenced more directly by primary socialization sources (e.g., the family, school, and peer groups), and indirectly by cultural context. Cultural influences may have functioned as a moderating variable in this study, and thus were not detected by the analyses. Further, because the mean scores for the situations were low for all items (i.e., between 0 and 1), the analyses may have been influenced by a “floor” effect in the data, preventing significant findings.

Implications for Practice

This study has implications for culturally specific practice with rural Hawaiian youth. The low mean frequency scores for the HYDOS items suggest that drug prevention programs should be initiated for rural Hawaiian youth no later than middle or intermediate school, as this time period precludes heavy exposure to drug offers or use for these youth. The factor structure suggests that drug prevention and treatment for these youth should address the core areas of peer pressure, family drug offers and context, and unanticipated drug offers in the school and community. The most salient items on the HYDOS (such as those with the highest frequency or difficulty scores) could also be used to elicit discussions related to drug offers and the most socially competent responses to them. Research has indicated that youth respond more favorably to prevention messages if those messages reflect characteristics of the targeted audience (Harthun, Dustman, Reeves, Hecht, & Marsiglia, in press). Because the HYDOS items reflect the situations and settings of Hawaiian youth in rural communities, they have the potential to facilitate the development of meaningful drug prevention strategies for these youth. Finally, the measure could be used to assess the extent of the pressure to use drugs in the areas of peers and family, in order to tailor drug prevention efforts to specific schools or communities.

Limitations of the Study

This study had several limitations. First, because active parental consent was required for youths' participation in this study, the sample may have been influenced by a selection bias. Staff from multiple schools assisting with the study indicated that several students who were the most at risk for drug use were not given parental consent to participate in the study. This selection bias may have influenced the generalizability of the findings to the community at large, as well as to other rural communities with concentrations of Hawaiian youth across the state. Further, because of the rural setting of the study, the findings may not be generalizable to urban communities in Hawai'i. Several items on the HYDOS included Hawaiian words (e.g., *pulehu*, *kanikapila*, etc.), which may have affected comprehension of the items for non-Hawaiian respondents. The Hawaiian subsample had significantly higher scores than the non-Hawaiian subsample on survey questions which gauged participants' ability to both speak and understand the Hawaiian language, suggesting that language comprehension may have affected the findings. Finally, the relationship of the questionnaire to social desirability was not assessed. The sensitive nature of the survey topic may have caused respondents to deny or overstate their exposure to drugs, thus affecting the validity of the findings.

Conclusions

Research focused on Native Hawaiians has been underrepresented in social work and related literatures (Mokuau et al., 2008); therefore, little is known about the antecedents or precursors to drug use for this population. This study addresses this issue by operationalizing culturally specific drug offer situations for Hawaiian youth in rural communities. This information has implications for the development and assessment of drug prevention efforts for these youth. Future research might attempt to replicate the study with a larger sample and additional items, in order to further specify the latent structure of the HYDOS. For example, items with cousins as drug offerers might form their own factor separate from the items with adult family members in a larger scale replication of the study. Further, additional evidence for construct validity is necessary, with additional samples across various islands of Hawai'i and with additional, related substudies that provide further validation. Because the level of the Hawaiian youth participants' connectedness to Hawaiian culture was not related to their level of exposure to drug offers in this study, future studies might examine the relationship between other aspects of culture (e.g., collectivism, acculturative stress) and level of exposure to drug offers. Finally, the goodness of fit of the 3-factor solution could also be addressed using confirmatory factor analysis in future research with another sample of Hawaiian youth.

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Figure 1.
Scree Plot for Factor Analysis of Hawaiian Youth Drug Offers Survey Items

Table 1

Native Hawaiian Youth Drug Offers Survey: Item Refinement and Selection

1. You are at your grandmother's house for a family get-together, and your uncle pulls you aside and asks you, "You like smoke some weed?"
2. Your cousin is visiting your house, and asks you if you'd like to smoke some marijuana. After you refuse, he asks, "You sure? You no like?"
3. You have just exited the movie theatre with two of your cousins. It is late in the evening and most of the stores around the theatre have closed. One of your cousins asks you if you'd like to smoke some weed.
4. Your older brother enters your bedroom, closes the door, and asks if you'd like to smoke some weed.
5. You are at school, and some of your friends want to skip class so that they can smoke pakalolo. They ask you to join them.
6. You start dating someone who is in high school, and you find out he/she is using drugs. He/she wants you to try smoking pot with him/her.
7. You have a friend whose sister is dating a high school aged boy. He uses drugs, and then your friend's sister starts using, too. You all go out together, and they offer you pakalolo.
8. There are two girls in your grade who are kind of *tida* and mean, and they use drugs. They try to encourage everyone to use. One day, they are in the bathroom making graffiti on the walls and smoking pakalolo. You walk in to use the bathroom, and they offer you some, but more like bully-tease you into trying.
9. On the nights that there is a full moon, lots of the older kids like to go out at night because they can *kanikapila* and smoke marijuana and drink beer outside. Your older cousin invites you to come along.
10. Your friends bring Bacardi to school and mix it with juice. They are drinking it on campus during recess. They offer you some.
11. One of your friends uses drugs, but you haven't tried any yet. He/She tells you to try some weed, or you're a "chicken."
12. You are at home having dinner with your family. Your parents are drinking beer with dinner, and your mom offers you some.
13. You are at home with family members. Your uncle is there, and he smokes cigarettes. He offers you one, and wants you to smoke with him.
14. Your dad, uncles, papa, and dad's friends are making *pulehu* in the yard, and you are with them. Your mom is inside the house. They are drinking a lot of beer, probably already drunk. Your dad offers you a beer.
15. On your school bus there are kids who bring beer to school in a soda can so it is not so obvious. They drink beer on the bus to and from school. One day, they ask you if you'd like to hang out with them.
16. During morning recess at school, you and your friends are hanging out behind the band building. Your friends are drinking alcohol and they offer you some. You say, "No thanks." One of your friends says, "Oh come on, have some."
17. You go to a community dance for kids. Some people are hanging out in the parking area drinking and using drugs. Your friend says to you, "Let's see what's going on in the parking lot."
18. You are at a park with a bunch of kids who are smoking cigarettes. They are passing the cigarette pack around, and it gets passed to you.
19. You are at a family party where the adults have coolers full of beer. They are getting drunk, so you and your cousins can take a beer without the adults noticing. One of your cousins says to you, "Let's grab one."
20. You go down to the beach where you see some of your friends, who happen to be smoking pakalolo. They notice you, and motion at you to join them.
21. During summer break, your friends invite you to go to the park with them. After a while, you end up going to someone's house, where your friends ask you if you want to smoke weed with them.
22. One of your classmates always hangs around with this group of older kids and they smoke weed every day. One day, your classmate asks you if you'd like to eat lunch with them.
23. Your friends are drinking beer, but you don't want to, so you say you need to go home. They tease you by saying, "Oh you're scared." You are afraid they might spread rumors or gossip about you at school.
24. Your friend's parents are away, so your friend has a party in the house. Some kids at the party brought "hards", and are pouring shots for everyone. They pass one to you.
25. Your best friend offers you marijuana. You don't know what might happen to your friendship if you said "no".
26. You are with a girl/boy you like and some other friends. They are all hiding in the bushes smoking weed. They ask you if you want to try some. After you say no, they say, "Just try this once, it's cool."
27. Your friends are playing a card game where they have to take a shot of hard liquor if they lose. They ask you if you want to play.
28. You and your teammates are at a state tournament. There are teams from all over the state, both boys and girls. Some of the older kids you met had snuck weed and "hards" in with them. Your teammate wants to go drink with this group of kids, and asks you to come with him/her.

29. You see some of your friends at the fair, so you go cruise with them for the night. Your friend has weed with her and wants to smoke. She offers you some.
30. You are staying at your cousin's house for the weekend. He's a little bit older than you (in high school). He asks you if you'd like to sneak out of the house to go meet up with friends at the park to smoke weed.
31. Your cousin is upset because she just broke up with her boyfriend and she wants to get drunk. So, she asks you to go to a party where kids are drinking and smoking pot.
32. Your friend brought alcohol to school, and put it in a Gatorade bottle. The security found out, and called your friend to the office. Your friend doesn't want to get busted, so he/she asks you to hold it for them while they go to the principal's office.
33. Your cousin brings marijuana to school and asks you if you'd like to go to the bathroom to roll some joints.
34. Your cousin who is in high school smokes cigarettes. He tells you, "Smoking makes you look cool," and then offers you one.
35. There is a building on campus where kids go behind to smoke and drink. The school security doesn't go back there, so you know can go there and not get caught. One of your cousins invites you to go there with him after school.
36. You're at the fair with someone you just started dating. He/She pulls out some weed and asks you if you'd like to smoke some.
37. You're at the mall with someone you just started dating. He/She pulls out a pipe, and asks if you'd like to smoke some "ice."
38. You're at the Boys and Girls Club after school. Someone that you know as a drug user is there, and appears to be "high." He/She asks you if you'd like to go behind the building with him.
39. You're walking around town late in the evening with your older cousin and his friends. They're all drinking, and notice that you haven't had any alcohol. One of them asks you if you'd like a beer.
40. You're playing basketball with your older cousin and his friends at a nearby school. After you're done with the game, he pulls out some cigarettes and asks you if you'd like one.
41. You're hanging out with your best friend at recess. He pulls out a pack of cigarettes and asks you if you'd like one.
42. You're in the parking lot at the mall. Your brother pulls out a pipe and asks you if you'd like to smoke some ice with him.
43. You're playing cards with your father. He's drinking a beer, and asks you if you'd like a sip.
44. You're camping with your 'ohana, and your father and uncles are drinking beer by the fire. Your father turns to your uncle and, gesturing to you, says "Go ahead and give him one."
45. A big, bulky boy in school is known to be the leader of a group of "tough kids," who fight and do drugs. He approaches you one day at recess and asks you if you'd like to hang out with his group.
46. You've just started at a new school, and don't know very many kids. A group of older boys in school that is known to use drugs and alcohol approach you at recess and ask you if you'd like to hang out with them.
47. You're at the park with your older cousin. He takes out a pipe full of ice and says, "Try this."
48. You're helping your uncle with chores on his ranch. He turns to you, takes out a pipe, and offers you some "ice".
49. You're at the beach with your friend and his 'ohana. Your friend's uncle is drunk and offers you and your friend some beer.
50. You're at a party with your 'ohana, and one of your older cousins offers you to take a sip of beer. You tell him you gotta go, but he keeps following you and asking you to drink some.
51. You walk past a group of students smoking cigarettes outside of the school campus before school. They say, "You like smoke?"
52. Your older brother recently entered high school, and started hanging out with a group of kids that smoke weed. He comes home from school one day and asks you if you'd like to try some.
53. A group of high school boys are hanging out in the school parking lot after school, smoking weed. As you walk by them on the way to the bus, one of them says to you, "Hey, come over here."
54. You're at the community recreational center after school. While in the locker room, your best friend takes out some marijuana from his pocket and says "want some?"
55. You're at a New Year's Eve Party with your 'ohana, and your auntie's boyfriend offers you some of his beer.
56. You're at the mall with your friend, and you run into your friend's older sister and her friends. She is smoking a cigarette and trying to act cool. She asks you if you'd like one.
57. You're hanging out at the beach with your 'ohana and one of your aunties asks you if you'd like some marijuana.
58. You're at your uncle's house helping with chores. He pulls you aside to help him with something and then asks you if you'd like some beer.
59. Your 'ohana is at your house for a Superbowl party. All of the adults are drinking alcohol, and, in front of everyone your father asks you, "Oh, you like drink some?"
60. Your older cousin is walking with you to the mall. He takes out some marijuana and says "Don't tell my parents. You like some?"

61. You pass by some classmates before school who are standing in front of the cafeteria. One of them pulls out a container and says, "You like some weed?"
  62. You're walking to class with a friend. He tells you that he has weed in his pocket and asks if you'd like some.
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Table 2

Factor Loadings and Communality Estimates (h^2) for Retained Items using Principal Axis Factoring and Promax Rotation

Item	Factor 1	Factor 2	Factor 3	h^2
8. There are two girls in your grade who are kind of <i>tida</i> and mean, and they use drugs. They try to encourage everyone to use. One day, they are in the bathroom making graffiti on the walls and smoking pakalolo. You walk in to use the bathroom, and they offer you some, but more like bully-tease you into trying.	.753	-.248	.002	.839
10. Your friends bring Bacardi to school and mix it with juice. They are drinking it on campus during recess. They offer you some.	.688	-.038	.065	.886
11. One of your friends uses drugs, but you haven't tried any yet. He/She tells you to try some weed, or you're a "chicken."	.581	.087	-.003	.827
15. On your school bus there are kids who bring beer in a soda can so it is not so obvious. They drink beer on the bus to and from school. One day, they ask you if you'd like to hang out with them.	.840	-.130	.090	.905
17. You go to a community dance for kids. Some people are hanging out in the parking area drinking and using drugs. Your friend says to you, "Let's see what's going on in the parking lot."	.685	.139	-.043	.895
20. You go down to the beach where you see some of your friends, who happen to be smoking pakalolo. They notice you, and motion at you to join them.	.790	.027	.123	.960
21. During summer break, your friends invite you to go to the park with them. After a while, you end up going to someone's house, where your friends ask you if you want to smoke weed with them.	.699	.088	.162	.962
22. One of your classmates always hangs around with this group of older kids and they smoke weed every day. One day, your classmate asks you if you'd like to eat lunch with them.	.660	-.030	.190	.950
24. Your friend's parents are away, so your friend has a party in the house. Some kids at the party brought "hards", and are pouring shots for everyone. They pass one to you.	.809	.180	-.114	.933
3. You have just left the movie theatre with two of your cousins. It is late in the evening and most of the stores around the theatre have closed. One of your cousins asks you if you'd like to smoke some weed.	.158	.625	.022	.904
4. Your older brother enters your bedroom, closes the door, and asks you if you'd like to smoke some weed.	.018	.730	-.112	.862
12. You are at home having dinner with your family. Your parents are drinking beer with dinner, and your mom offers you some.	.136	.740	-.173	.861
14. Your dad, uncles, papa, and dad's friends are making pulchhu in the yard, and you are with them. Your mom is inside the house. They are drinking a lot of beer, probably already drunk. Your dad offers you a beer.	.104	.563	.010	.930
34. Your cousin who is in high school smokes cigarettes. He tells you, "smoking makes you look cool," and then offers you one.	.010	.646	.242	.967
43. You're playing cards with you father. He's drinking a beer, and asks you if you'd like a sip.	.158	.618	-.028	.939
44. You're camping with your 'ohana, and your father and uncles are drinking beer by the fire. Your father turns to your uncle and, gesturing to you, says, "Go ahead and give him one."	.100	.452	.150	.776
47. You're at the park with your older cousin. He takes out a pipe full of ice and says, "Try this."	-.332	.821	.160	.961
55. You're at a New Year's Eve Party with your 'ohana, and your auntie's boyfriend offers you some of his beer.	-.054	.670	.146	.809
25. Your best friend offers you marijuana. You don't know what might happen to your friendship if you say "no".	.167	.101	.506	.886
37. You're at the mall with someone you just started dating. He/She pulls out a pipe, and asks you if you'd like to smoke some "ice."	.074	-.126	.595	.958
53. A group of high school boys are hanging out in the school parking lot after school, smoking weed. As you walk by them on the way to the bus, one of them says to you, "Hey, come over here."	.187	-.223	.876	.960
54. You're at the community recreational center after school. While in the locker room your best friend takes out some marijuana from his pocket and says "want some?"	.253	-.209	.834	.983

Item	Factor 1	Factor 2	Factor 3	h^2
60. Your older cousin is walking with you to the mall. He takes out some marijuana and says "don't tell my parents. You like some?"	.130	.165	.633	.953
61. You pass by some classmates before school who are standing in front of the cafeteria. One of them pulls out a container and says, "You like some weed?"	.155	.029	.700	.933

Table 3

Inter-Subscale Correlations Derived from the Three-Factor Solution

	Subscale 1	Subscale 2	Subscale 3
Subscale 1	1.00		
Subscale 2	0.66	1.00	
Subscale 3	0.76	0.63	1.00

Note: Subscale 1 = Peer Pressure; Subscale 2 = Family Offers and Context; Subscale 3 = Unanticipated Drug Offers

Table 4

Most Frequent Situations for Native Hawaiian Youth (n = 194)

Item	Situation	Mean (NH)	Mean (Non- NH)
19	You are at a family party where the adults have coolers full of beer. They are getting drunk, so you and your cousins can take a beer without the adults noticing. One of your cousins says to you, "Let's grab one."	.69	.19***
17	You go to a community dance for kids. Some people are hanging out in the parking area drinking and using drugs. Your friend says to you, "Let's see what's going on in the parking lot."	.47	.27
29	You see some of your friends at the fair, so you go cruise with them for the night. Your friend has weed with her and wants to smoke. She offers you some.	.42	.16*
14	Your dad, uncles, papa, and dad's friends are making pulehu in the yard, and you are with them. Your mom is inside the house. They are drinking a lot of beer, probably already drunk. Your dad offers you a beer.	.41	.02***
10	Your friends bring Bacardi to school and mix it with juice. They are drinking it on campus during recess. They offer you some.	.41	.20
62	You're walking to class with a friend. He tells you that he has weed in his pocket and asks if you'd like some.	.40	.16*
26	You are with a girl/boy you like and some other friends. They are all hiding in the bushes and smoking weed. They ask you if you want to try some. After you say no, they say, "Just try this once, it's cool."	.39	.05***
12	You are at home having dinner with your family. Your parents are drinking beer with dinner, and your mom offers you some.	.39	.09**
9	On the nights that there is a full moon, lots of the older kids like to go out at night because they can kanikapila and smoke marijuana and drink beer outside. Your older cousin invites you to come along.	.39	.04***
43	You're playing cards with your father. He's drinking a beer, and asks you if you'd like a sip.	.38	.16*

*
p < .05,**
p < .01,***
p < .001