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INITIAL PSYCHOMETRIC VALIDATION OF HE 'ANA MANA'O O NĀ  
MO'OMEHEU HAWAII: A HAWAIIAN ETHNOCULTURAL INVENTORY (HEI)  
OF CULTURAL PRACTICES

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## Abstract

The present study describes the psychometric development and validation of the Hawaiian Ethnocultural Inventory (HEI), an ethnocultural survey of Native Hawaiian ethnic identity that measures the degree to which individuals are knowledgeable of, believe in, and engage in culturally relevant practices of the Hawaiian heritage. Construction of the instrument was influenced by extant research and previous recommendations suggesting that measures of acculturation and ethnic identity include broad categories or factors that assesses specific cultural practices, customs, and beliefs. The HEI was administered to an adult population of Native Hawaiians,  $N=237$ . Exploratory factor analysis revealed a five factor structure that included the following: 1) Beliefs in Hawaiian Cultural Practices, 2) Knowledge of Hawaiian Cultural Practices, 3) Frequency of Performing Arts, 4) Frequency of Ocean Traditions, and 5) Frequency of Spiritual and Family Customs. The factors collectively accounted for 61% of the total variance and reliability estimates for the five factors were uniformly high ranging from .85 - .97. Subsequent 1-Way ANOVA's and post-hoc analyses posited significant between group differences between HEI factors and demographic variables. In conclusion, the data provides supporting evidence of the instrument's construct validity and scale reliability as a measure of Native Hawaiian ethnic identity that may be a useful tool for research among Native Hawaiians in an array of health fields.

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## Chapter I: Introduction and Review of the Literature

### Introduction

Interest in issues related to acculturation and ethnic identity has increased significantly over the past 20 years, as evidenced by an accretion of published research and psychometric measures concerning these interrelated constructs. In excess of 50 distinct instruments for measuring acculturation and ethnic identity currently exist, with nearly all developed with respect to specific ethnic groups and specific samples (e.g., adolescents, adults) within these groups (for a review, see Paniagua, 1994; Ponterotto, Casas, Suzuki, & Alexander, 1995).

Past studies provide convincing evidence concerning the relationship of acculturation and ethnic identity with healthy psychological functioning (Mendelberg, 1986; Parham & Helms, 1985a; Phinney, 1991), increased risk for psychiatric disability (Burnam, Hough, Karno, Escobar, & Telles, 1987), psychological distress (Kaplan & Marks, 1990; Krause & Goldenhar, 1992), psychosocial adaptation (Streltzer, Rezendes, & Arakaki, 1996), sociocultural status (Sodowsky, Lai, & Plake, 1991) and utilization of health and mental health services (Atkinson & Gim, 1989; Pomales & Williams, 1989; Solis, Garcia, & Shelton, 1990) across a wide range of ethnic populations and minorities. These include Hispanic Americans (Cuellar, Arnold, & Maldonado, 1995; Cuellar, Harris, & Jasso, 1980; Der-karabetian & Ruiz, 1997; Garcia, 1982; Marin & Gamba, 1996; Mendoza, 1989; Norris, Ford, & Bova, 1996; Szapocznik, Scopetta, Arnalde, & Kurtines, 1978), African Americans (Lanrine & Klonoff, 1994; Parham & Helms, 1981; Sanders Thompson, 1991; Sellers, Rowley, Chavous, Shelton, & Smith, 1997), Asian Americans (Anderson et al., 1993; Masuda, Matsumoto, & Meredith, 1970; Suinn Rickard-Figueroa,

Lew, & Vigil, 1987; Ting-Toomey, 1981), Greek Americans (Constantinou & Harvey, 1985; Harris & Verven, 1996), Native American Indians (Hoffmann, Dana, & Bolton, 1985; Oetting & Beauvais, 1991; Oetting, Swaim, & Chiarella, 1998; Zimmerman, Ramirez-Valles, Washienko, Walter, & Dyer, 1996), and Native Hawaiians (Hishinuma et al., 2000; Rezendes, 1993).

Definitions of acculturation and ethnic identity have varied in published reports over past years. Growing consensus among researchers suggests that acculturation generally refers to various psychosocial changes that occur at different levels between two distinct or independent cultural groups as a result of initial contact and/or continued interaction (Berry, 1980; Dana, 1993; Redfield, Linton, & Herskovits, 1936). It is traditionally viewed as both a group and individual process that affects changes at different levels as a result of a cultural group's interaction with a new culture (Berry, 1979; Marin, 1993). Transformations that occur at the group level are manifested in one or more conflicting psychosocial patterns and include physical (e.g., new living area, population increase or depopulation), biological (e.g., nutritional status, introduction of new diseases, bi-racial or multiethnic inter-marriages), political (e.g., government changes, cultural leadership), economic (e.g., agricultural, service industry), cultural (e.g., linguistic, religious, and social institutions), and social (e.g., group interactions) domains (Berry, 1983; Berry & Kim, 1987). In contrast, individual adaptation includes significant changes in behavior, the extent of acculturative coping abilities and adjustment, health status, and degree of ethnic identity.

Measures of acculturation typically assess where individuals are in the process of psychosocial change, whereas ethnic identity is concerned with the relationship between



an individual and their cultural heritage. Thus, ethnic identity refers to the extent to which an individual endorses and practices a way of life associated with a particular cultural tradition (Marsella & Kameoka, 1989). It is viewed as an aspect of acculturation that concerns individuals and their relationship with their own cultural-ethnic group as a subgroup of a larger society (Phinney, 1992).

The conceptual understanding and measurement of acculturation and ethnic identity is complex, as evidenced by the inconsistencies across research reports in definitions and differences in factors derived as psychometric indices of the two constructs (Magana et al., 1996). Some authors use the terms ethnic identity and acculturation synonymously, potentially negating important between-construct differences and their measurement (Bhugra et al., 1999; Nagata, 1994). Collectively, extant literature continues to lack a uniformed approach concerning the theoretical framework(s), role distinction, and psychometric measurement of acculturation and ethnic identity (Magana et al., 1996; Nagata, 1994; Olmedo, 1979; Phinney, 1990; Ponterotto, 1989).

Although significant progress has occurred in developing measures of acculturation and ethnic identity, the diversity of psychometric approaches and lack of psychometric rigor continues to characterize the field, rendering across-study comparisons difficult (Marin, 1992). The diversity of psychometric approaches and corresponding assessment instruments may nevertheless prove useful for identifying important components underlying the construct of ethnic identity. For example, some researchers highlight different domains of ethnic identity that may facilitate measurement of processes related to ethnic identity (Ramirez, 1984; Sabnani, & Ponterotto, 1992). These components include personal variables such as self-identification, sense of belonging and commitment

to cultural group (Der-Karabetian & Ruiz, 1997; Zak, 1973), positive and negative attitudes towards one's ethnic group (Parham & Helms, 1981), sociocultural activities that include language (Deyo, Diehl, Hazuda, & Stern, 1985; Marin & Gamba, 1996), attitudes and cultural beliefs (Cheng, & Hsu, 1995; Harris & Verven, 1996; Zimmerman, Ramirez-Valles, Washienko, Walter, & Dyer, 1996), political activity (Parham & Helms, 1981; 1985b), and other culturally specific behaviors, values, social relationships, and food preferences (Szapocznik, Scopetta, Arnalde, & Kurtines, 1978).

Comprehensive measures of ethnic identity have incorporated a multidimensional approach in recent years by balancing the psychological-cognitive dimensions with behavioral and cultural components (Cuellar, Arnold, & Maldonado, 1995; Cuellar, Harris, & Jasso, 1980; Felix-Ortiz, Newcomb, & Myers, 1994; Sanders Thompson, 1991; Sellers, Rowley, Chavous, Shelton, & Smith, 1997). This approach has helped identify domains such as language proficiency, social-cultural activities, and attitude towards one's cultural group as potentially important components in understanding ethnic identity. Other variables relevant to understanding ethnic identity, such as the knowledge and understanding of specific cultural practices, belief in these practices, and the frequency with which cultural practices are incorporated into one's lifestyle, have received scant empirical scrutiny.

Many Polynesian island nations, including Hawai'i, have experienced rapid colonization, cultural conflict, and acculturation attributed to the early proliferation of European-American explorers into the Pacific Rim beginning in late 1700's through the 1800's (Hezel, 1991; Trask, 1987). The cumulative effects of acculturation and impact on ethnic identity among Native Hawaiians, however, have received limited attention

(Crabbe, 1998). One of the many identified harmful consequences of western contact has been a progressive disintegration of Hawaiian culture and near eradication of the Native Hawaiian people (Blaisdell, 1989, 1993, 1996; Blaisdell & Mokuau, 1991; King, 1987). Although the historical, cultural, and psychosocial background of Native Hawaiians has been documented (E Ola Mau, 1985; Native Hawaiian Educational Assessment Project, 1983, 1993), few studies have focused on establishing psychometrically sound instruments for assessing ethnic identity among this indigenous population.

The earliest attempt to develop measures of Native Hawaiian ethnic identity examined the effects of psychosocial change among Native Hawaiians living in a rural community (Howard, 1974). A Cultural Self-Identification Scale and Hawaiian Conceptual Test were developed to examine cultural identification based on the degree of ethnic group influences across multiple ethnicities and knowledge and understanding of Hawaiian cultural terms, respectively. Results indicated that Native Hawaiian women who exhibited greater Hawaiian ancestry and ratings on the Evaluation of Spouse's Role Performance (i.e. Hawaiian versus Non-Hawaiian ethnic descriptions of spouses) and Cultural Self-Identification Scale tended to have a lower self-concept, whereas females with higher scores on the Hawaiian Conceptual Test evidenced higher levels of self-esteem (Howard, 1975).

More recent efforts focused on designing instruments (e.g., "Nā Mea Hawai'i") to assess the degree to which individuals possess knowledge of traditional Hawaiian terms, customs, history, culture, and the frequency with which they participate in contemporary Hawaiian activities (Rezentes, 1993). These efforts proved useful for differentiating among individuals of Native Hawaiian, Japanese, and Caucasian ethnic heritage

(Plummer, 1995). Subsequent efforts to discriminate between individuals of Native Hawaiian heritage and non-Hawaiians using the Nā Mea Hawai'i have also been successful. The instrument's predictive validity with respect to identifying associations between ethnic identity and other psychosocial variables such as depression, anxiety, and lack of social support, however, is relatively weak and necessitates further study (Streltzer, Rezendes, & Arakaki, 1996).

A more recent attempt to construct a cultural-ethnic identity scale for use with adolescents of Native Hawaiian heritage (i.e., the "Hawaiian Cultural Scale: HCS – Adolescent Version") revealed strong internal consistency for its 7 subscales and satisfactory levels of construct and predictive validity in differentiating between Native Hawaiian and non-Hawaiian adolescents based on expected associations among subscale scores and a range of cultural values, beliefs and practices (Hishinuma et al., 2000). The instrument, however, has a limited range of use (i.e., restricted to adolescents) and its underlying factor structure and test-retest reliability await empirical investigation.

Collectively, extant research concerning the psychometric measurement of ethnic identity among Native Hawaiians is limited and the field lacks a comprehensive measure that includes an index that assesses culturally specific practices. Moreover, past studies have failed to address varying degrees of a person's knowledge of, belief in, and the frequency with which they practice traditional customs.

The purposes of the present study were to (a) describe the development of an ethnocultural inventory that specifically measures knowledge of, belief in, and frequent level of Hawaiian cultural practices among an adult population of Native Hawaiians, and (b) to psychometrically validate the measure by evaluating its reliability, validity, and

factor structure using conventional scale construction procedures. The primary objective of this inventory is to measure the extent of a person's knowledge of, belief in, and frequency of participating in Hawaiian cultural practices. The rationale for the development of such a measure is based on empirical research that recommends that measures of acculturation and ethnic identity include items targeting specific cultural behaviors, values, practices, and attitudes (Berry, Trimble, & Olmedo, 1986; Phinney, 1990; Rogler, Cooney, & Ortiz, 1980). In defining ethnic identity as it relates to this particular study, it is important to acknowledge that all persons of Native Hawaiian descent can be located on a Hawaiian cultural continuum (i.e., the extent to which a person participates in Hawaiian activities varies). Thus, for purposes of the present study, cultural-ethnic identity represents the degree to which individuals of Native Hawaiian descent culturally identify themselves as Hawaiian (Ratima, Potaka, Durie, & Ratima, 1993). It is hypothesized that (a) increased blood quantum will be positively associated with Hawaiian Ethnocultural Inventory factors, (b) age will be positively associated with knowledge of and belief in Hawaiian cultural practices and inversely related with the frequency with which an individual engages in cultural practices, and (c) an individual's level of education will not be associated with cultural identity.

## Chapter II: Methodology

### Method

A pilot study was initially conducted to obtain judgments concerning 41 traditional cultural practices identified by means of a comprehensive literature review on Hawaiian culture (Alu Like Inc., 1985b; Howard, 1974; Kamakau, 1964; Kamakau 1976; Kepelino, 1932; Malo, 1951; Mitchell, 1992; Pukui, Haertig, & Lee, 1972; Pukui, Haertig, & Lee, 1979). One hundred adults (58 females, 42 males) were recruited from community and cultural organizations on the island of Oahu based on a pre-determined age grouping table (i.e., an approximately equal number of adults in the following age groups: 21-29, 30-39, 40-49, 50-59, >60) to survey a broad sample of the community. Adults were asked to rank order the 41 traditional cultural practices along a 1 (most frequently practiced) to 20-point (least frequently practiced) continuum. The mean age and educational level of participants was 39.8 and 14.2 years, respectively. Obtained rankings were reviewed by a panel of 4 expert judges with advanced degrees (1 MD, 1 DSW, 1 Ph.D., and 1 M.A.), three of whom were of native Hawaiian ancestry and highly knowledgeable of native Hawaiian culture. Judges were asked to identify the cultural practices to be included in the scale based on the obtained rankings and the perceived significance of each practice with respect to its perpetuation and familiarity among Native Hawaiians. Disagreements among panel experts were discussed until consensus was reached concerning whether a particular item should be included or excluded in the final item pool based on its ranking and cultural significance. A total of 27 cultural practices emerged from the initial 41 ranked practices and were included in the formal scale development stage of the study.

## Scale Development

Previous scale development concerning Native Hawaiian culture has traditionally involved creating a large pool of items related to cultural practices of Native Hawaiians, then subjecting the items to statistical analysis to derive potentially valuable factors that may be related to understanding different aspects of culture and cultural identity (Hishinuma et al., 2000; Rezentes, 1993; Howard, 1974). The results may have achieved a satisfactory statistical objective, yet failed to accurately represent underlying dimensions related to particular culture domains and the degree to which members of the culture identify with cultural norms.

The present investigation, whose primary purpose was to create a valid and reliable measure of cultural identity among Native Hawaiians, adopted an alternative strategy based on extant literature, an idiographic analysis and consideration of Hawaiian culture. Cultural identity was considered to involve not only knowledge of one's culture, but the degree to which an individual believes in particular cultural practices (i.e., that it is a valid representation of reality), and routinely engages in these practices with a frequency consistent with the expected belief and cultural norms. Three unique aspects of cultural identity were identified and an item pool based on the 27 most prevalent and important cultural practices was developed to create the Hawaiian Ethnocultural Inventory (HEI). The three primary dimensions thought to underlie cultural identity among Native Hawaiians included (a) knowledge of a particular cultural practice (e.g., How knowledgeable are you regarding la'au lapa'au or traditional Hawaiian herbal healing?), (b) belief in a cultural practice (e.g., Do you believe that la'au lapa'au or traditional herbal healing an important part of Hawaiian culture?), and (c) the frequency by which an

individual engages in a given cultural practice on a routine basis (e.g., In your lifetime, how frequent was la'au lapa'au or traditional herbal healing a part of your life?). Scale items for the three dimensions were developed using the 27 cultural practices that emerged from the pilot study, and were subsequently reviewed by the expert panel of judges for content and face validity, scale structure, and the clarity of each item. Panel members rated whether each question should be included on the inventory using a 5-point scale of appropriateness from 1 (Not Clear - Inappropriate) to 5 (Very Clear-Appropriate). Items receiving a 1, 2, or 3 rating were reworded and resubmitted for consideration by the panel. Only items receiving a final rating of 4 or 5 and approved by a consensus of the judges were included on the inventory.

A 5-point Likert scale was subsequently developed for all items within each of the three dimensions (i.e., knowledge of a particular cultural practice, belief in a particular cultural practice, frequency of engaging in a particular cultural practice). The administered version of the Hawaiian Ethnocultural Inventory (HEI) consisted of several questions asking about each of the 27 cultural practices and contained a total of 243 items, with 81 questions forming each of the three dimensions.

#### Participants

Four hundred and twenty-seven adults (155 males, 272 females) were recruited from community (i.e., churches, social-ethnic groups) and Native Hawaiian organizations (i.e., civic clubs, alumni associations, cultural groups such as h~lau's or schools of traditional dance, n~ koa or warrior groups, and chant groups) throughout the State of Hawaii and across the continental United States. A description of the demographics of the sample is presented in Table 1.



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Insert Table 1 about here

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Two hundred and thirty-eight (55.7%) of the participants identified themselves as Native Hawaiian (83 males, 155 females) and 189 (44.3%) were of non-Hawaiian descent (72 males, 117 females). For the Native Hawaiian cohort, 19.7% reported being less than 24% blood quantum, 34.9% reported being between 25% and 49% blood quantum, 30.7% reported being between 50% and 74% blood quantum, and 14.7% reported being between 75% and 100% blood quantum. Self-report of blood quantum was operationally defined as a Native Hawaiian person who has any ancestors that were natives, prior to 1778, of the area that is now the State of Hawaii as evidenced by: (a) genealogical records, (b) kupuna (elders) or kama`aina (long-term community residents) verification, and/or (c) birth records of the State of Hawaii as stipulated in the Native Hawaiian Health Care Improvement Act of 1988 (1997). The age of participants ranged from 21 to 86 years ( $M = 40.01$ ,  $SD = 15.23$ ), and there were no significant differences in age,  $t^2(5, N = 427) = 7.972$ ,  $p = .15$ , between Native Hawaiians and non-Hawaiian participants (see Table 1).

#### Procedures

All participants signed an informed consent that was approved by the University of Hawaii's Institutional Review Board prior to completing the inventory. Participants were informed of the study's goals, benefits, potential risks, and protections used to ensure confidentiality of responses. Instructions for completing the HEI and accompanying demographic form were provided to all participants. Completion of the HEI required

approximately 45-60 minutes. Completed inventories and demographic forms were collected by trained research assistants and used to form a database appropriate for statistical analysis of the results.

## Chapter III: Results and Discussion

### Results

A three tier statistical approach was used to investigate the primary purposes of the present investigation. In the first tier, conventional exploratory factor analytic procedures were used to explore the underlying factor structure of the Hawaiian Ethnocultural Inventory (HEI) and internal consistency estimates were derived for each scale. Correlations were obtained for associations between HEI factors to assess for construct validity. In the second tier, Native Hawaiians and non-Hawaiian cohorts were compared by means of 1-way ANOVAs to assess the inventory's ability to discriminate between groups on culturally relevant factors. A final set of analyses was conducted to examine the hypothesized relationships between derived factors and three sociodemographic variables (i.e., age, blood quantum, level of education).

#### Tier 1: Factor Structure

Exploratory Factor Analysis (EFA) was carried out using Maximum Likelihood (ML) Factor Extraction and oblique (Promax) factor rotation. Examination of eigenvalues greater than 1.0 and review of the scree plot were utilized to determine the appropriate number of factors. Inclusion and exclusion criteria for items that best measured each factor were as follows: a) any item whose factor loading was greater than .50 on one factor and less than .30 on all other factors was retained; b) any item whose factor loading ranged between .30-.50 on one factor and was less than .20 on all other factors was retained; and (c) any item that did not meet the previous two criteria was discarded. A final factor solution was obtained by conducting consecutive exploratory factor analyses (rotations) until all scale items met the a priori inclusion criteria. Examination of

the eigenvalues and review of the scree plot using the aforementioned criteria yielded a five-factor solution.

The five factors that emerged based on the exploratory factor analysis included: Beliefs in Hawaiian Cultural Practices (26 items), Knowledge of Hawaiian Cultural Practices (19 items), Frequency of Performing Arts (15 items), Frequency of Ocean Traditions (11 items), and Frequency of Spiritual and Family Customs (9 items). These factors accounted for 32.6%, 12.9%, 6.3%, 5.6%, and 4.1% of the scale's variance, respectively (i.e., the 5 factors collectively accounted for 61% of the total variance). Item loadings for the factors are shown in Table 2. Inspection of the table reveals that the first two factors consisted of items hypothesized to represent an individual's level of beliefs in cultural practices and knowledge of these practices, respectively. In contrast, the frequency with which individuals practice cultural traditions loaded onto three distinct factors that were specific to the type of traditions and customs practiced. For example, Frequency of Performing Arts (Factor III) included items surveying traditional as well as contemporary practices consisting of chant (*ʻoli*), modern dance (*hula ʻauana*), traditional dance (*hula kahiko*), lei making (*mea lei haku*), Hawaiian language (*ʻōlelo Hawaiʻi*) and Hawaiian music (i.e., playing an instrument or singing). Frequency of Ocean Traditions (Factor IV) consisted of practices associated with the ocean like canoe voyaging (*holomoana*), surfing (*papa he ʻe nalu*), canoe paddling (*hoe wa ʻa*), fishing (*lawai ʻa ʻana*), and prayer/meditation at or near mountains/seashore/temple. And, Frequency of Spiritual and Family Customs (Factor V) consisted of practices such as *hānai* or rearing children, *lūau* or feast celebrations, family values, and spirituality (i.e., going to church, reading the bible, and prayer).

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Insert Table 2 about here

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Internal consistency for the five factors was calculated using Cronbach's alpha (Cronbach, 1951). Derived estimates for the five factors were uniformly high: Beliefs in Hawaiian Cultural Practices (.97), Knowledge of Hawaiian Cultural Practices (.95), Frequency of Performing Arts (.96), Frequency of Ocean Traditions (.89), and Frequency of Spiritual and Family Customs (.85).

#### Tier 2: Between-Group Differences

A series of 1-way ANOVAs were conducted to examine hypothesized differences between Native Hawaiians and non-Hawaiians on the Hawaiian Ethnocultural Inventory's five culturally relevant factors. As expected, Native Hawaiians scored significantly higher than their Non-Hawaiian counterparts on the Belief in Hawaiian Cultural Practices [ $F(1,425) = 52.715$ ,  $MSe = 493.450$ ,  $p < .01$ ], Knowledge of Hawaiian Cultural Practices [ $F(1,425) = 110.604$ ,  $MSe = 204.417$ ,  $p < .01$ ], Frequency of Performing Arts [ $F(1,425) = 61.944$ ,  $MSe = 240.422$ ,  $p < .01$ ], Frequency of Ocean Traditions [ $F(1,425) = 13.202$ ,  $MSe = 56.109$ ,  $p < .01$ ], and Frequency of Spiritual and Family Customs [ $F(1,425) = 33.932$ ,  $MSe = 73.242$ ,  $p < .01$ ] factors.

#### Tier 3: Relationships Between Factors and Sociodemographic Variables

A series of 1-way ANOVAs were conducted to examine the relationships between the five factors of the Hawaiian Ethnocultural Inventory and sociodemographic variables associated with the Native Hawaiian cohort (i.e., age, blood quantum, level of education)

considered relevant to these factors. It was hypothesized that higher inventory factor scores would be associated with higher blood quantum, older age, and higher level of education. The results revealed a significant main effect for Blood Quantum using Knowledge of Hawaiian Cultural Practices as the dependent variable [ $F(3,234) = 8.298$ ,  $Mse = 1927.554$ ,  $p < .01$ ]. No other significant main effects were found for Blood Quantum and the remaining four inventory factor scores. Post-hoc analyses using Tukey's HSD revealed that Native Hawaiians with the greatest level of blood quantum (i.e., 25-49%, 50-74%, 75-100%) scored significantly higher on the Knowledge of Hawaiian Cultural Practices factor than those with the lowest (i.e.,  $\leq 24\%$ ) blood quantum level ( $p < .01$ ). Native Hawaiians with the highest level of blood quantum (75-100%) also scored significantly higher on the factor than both intermediate (25-49%, 50-74%) blood quantum groups ( $p < .01$ ). No other between-group contrasts were significant (see Table 3 for means).

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Insert Table 3 about here

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A significant main effect was also found for age using Frequency of Ocean Traditions as the dependent variable [ $F(5,232) = 3.754$ ,  $MSe = 250.083$ ,  $p < .01$ ], but not for the other four factor scores. Post analyses using Tukey's HSD revealed that the two oldest subgroups (60-69 year,  $\geq 70$ ) of Native Hawaiians were not significantly different from one another but scored significantly higher on the Frequency of Ocean Traditions factor compared to the four younger age subgroups (21-29 year, 30-39 year, 40-49 years, 50-59 years) of Native Hawaiians ( $p < .01$ ). Native Hawaiians between 50 and 59 years of

age also scored significantly higher than two of the younger (21-29 years, 40-49 years) subgroups ( $p < .01$ ), and the 40-49 year old subgroup scored significantly higher than the 30-39 year old subgroup ( $p < .05$ ). No other between-group differences were significant. Frequency of Ocean Traditions factor score means for the six groups are depicted in Table 4.

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Insert Table 4 about here

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Finally, a significant main effect for education was found using the Belief in Hawaiian Cultural Practices [ $F(4,233) = 3.584$ ,  $MSe = 1304.11$ ,  $p < .01$ ] but not the other four factor scores as the dependent variable. Post analyses using Tukey's HSD revealed that the three subgroups of Native Hawaiians with the most years of education (13-16 years, 17-18 years,  $\geq 19$  years) scored significantly higher on the Belief in Hawaiian Cultural Practices factor compared to the two subgroups with the fewest years ( $< 12$  years, 12 years) of formal education ( $p < .01$ ). The subgroup with 17 to 18 years of education also scored significantly higher on the factor than the group with 13 to 16 years of education ( $p < .01$ ). No other between-group contrasts were significant. Belief in Hawaiian Cultural Practices factor score means for the five sub-groups are depicted in Table 5.

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Insert Table 5 about here

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## Discussion

The primary purpose of the present study was to develop an instrument that may prove useful for assessing acculturation and ethnic identity in individuals of Native Hawaiian heritage. Construction of the instrument was influenced by extant research (Harris & Verven, 1996; Landrine & Klonoff, 1994; Oetting & Beauvais, 1991) and previous recommendations (Berry, Trimble, & Olmedo, 1986; Phinney, 1990; Rogler, Cooney, & Ortiz, 1980) suggesting that measures of acculturation and ethnic identity include broad categories or factors that assess the degree to which individuals of a particular heritage are knowledgeable of, believe in, and engage in culturally relevant practices. Inventory items were created using pilot questionnaires and reviewed by a panel of expert judges to ensure that they were representative of ethnic identity among Native Hawaiians (i.e., content validity). These items were subsequently evaluated using conventional factor analytic procedures and resulted in a 5-factor solution.

Two factors were consistent with *a priori* hypotheses involving knowledge of (*`Ike*) and belief in (*Mana`o`i`o*) Native Hawaiian cultural practices. The hypothesized third factor emerged as three distinct factors, all of which were related to the frequency with which individuals engage in culturally relevant practices. These were psychometrically distinguishable based on the type of practices assessed: performing arts (*Loina Hōiʻike*), ocean traditions (*Loina Moana*), and spiritual/family (*Loina Ho`omana/`Ohana*) customs. Internal consistency was uniformly high for all five factors and indicates that individuals responded with a high degree of consistency to items and that item responses obtained at the same time correlate highly with each other. Collectively, these results indicate that a three dimensional approach (knowledge of, belief in, and frequency of practice), with the



third dimension additionally isolated into distinct domains based on the type of cultural practice, provides a useful approach for conceptualizing ethnic identity among Native Hawaiians.

The results obtained in the current study are consistent with several aspects of previously constructed instruments developed to assess ethnic identity among Native Hawaiians (Howard, 1974; Rezentes, 1993; Hishinuma et al., 2000). For example all three employed techniques estimating aptitude of Hawaiian vocabulary terms while the Nā Mea Hawaii and the Hawaiian Cultural Scale included items to appraise values and attitudes concerning traditional as well as contemporary customs and history. The Hawaiian Cultural Scale, however, also included subscales associated with cultural lifestyle, folklore, socio-political causes, language proficiency, and groups of items pertaining to non-Hawaiian beliefs and understanding of Hawaiian culture in the home, school, and/or from friends and neighbors. Conversely, the conceptualization of the HEI stresses that the construct of Hawaiian ethnic identity is contingent upon a comprehensive assessment of an individual's factual knowledge base of, convictional belief in, and frequent participation in a broad range of cultural repertoires as opposed to a limited number select customs. The conceptual basis of the instrument also emphasizes that cultural characteristics that define individuals as well as ethnic groups are associated with certain cultural traditions and customs that are both cognitive (e.g., To what extent are you knowledgeable about types of native fish?; How strong is your belief that fishing ought to be carried on as part of Hawaiian culture?) and behavioral (e.g., In the past month, how often did you go fishing?) in nature. These ethnic determinants are connected by and linked to a particular cultural practice of origin and are dependent upon exposure

to and comprehension of these factors. Moreover, the conceptualization behind the HEI posits that a person's cultural origin and ethnic identification is rooted not only in the proficiency of factual information and attitudinal perceptions, but conjointly with active participation in a diverse range of cultural traditions. Therefore, one component may be essential but not singularly sufficient for a comprehensive determination of identification with Native Hawaiian culture. A significant feature that supports this hypothesis and distinguishes the HEI from other measures is the psychometric disparity with reference to the validity of its underlying conceptual framework. Although previous instruments are referred to as scales and survey portions of cultural themes based on knowledge of, belief in, and involvement in ethnic customs, their ability to capture the underpinnings of the Hawaiian identity construct is limited owing to a failure to utilize conventional statistical procedures such as factor analysis. As a result, the validity of the proposed dimensions is largely unknown and awaits empirical scrutiny. Exploring these areas collectively utilizing the methodology executed in this study in concert with conventional analytic procedures that examines the underlying factor structure is a critical step toward appreciating the core rudiments of Hawaiian ethnic identity.

Preliminary evidence of the inventory's postdictive validity was obtained by examining factor score differences between individuals of Native Hawaiian and non-Hawaiian heritage. Significant differences between the two groups emerged for all five factor scores as expected and indicate that individuals of Native Hawaiian heritage possess significantly greater knowledge of and belief in culturally relevant practices, and engage in these practices more often compared to individuals of non-Hawaiians heritage.

Additional evidence of the inventory's construct validity stems from the observed differences among Native Hawaiians on the derived factors as a function of their level of blood quantum, education, and age. For example, Native Hawaiians with higher blood quantum scored significantly higher on the Knowledge of Hawaiian Cultural Practices than those with lower blood quantum. Although it is not possible to discern a cause and effect relationship between these two variables, a plausible explanation is that Native Hawaiians with a higher blood quantum have greater exposure to Hawaiian customs and practices within their families because they are modeled by parents and other family members who value and promote culturally relevant practices. Perhaps the transmission of cultural information is consistent among Native Hawaiians not only with greater biological predispositions but who also possess interests in as well as demonstrate a pattern of perpetuating customs and practices within families and across generations. Thus, the likelihood of ethnic folklore, facts, and data surviving from one generation to the next is greatly enhanced. Consequently, such an example may be a basis for other preferences such as the selection of social groups, peers, and even relationship partners as a means to share common values and goals.

More strongly held beliefs in Native Hawaiian cultural practices were also evident among Native Hawaiians with greater educational attainment in terms of years of formal schooling. This was particularly true among those who continued their formal education beyond high school. Greater opportunities at universities and colleges, particularly in Hawaii, may account for this finding owing to formal baccalaureate programs in Hawaiian studies, the revival of Hawaiian language and instructional classes, and increased social consciousness of political movements on Native Hawaiian sovereignty

and indigenous rights. If the above were true a similar correspondence would be expected with other HEI factors. One would predict a similar pattern between knowledge of Hawaiian cultural practices and years of education considering its cognitive disposition and the acquirement of knowledge in instructional environments. Although it is logical, attainment of cultural knowledge in upper levels of higher learning proved insignificant. Thus, the fact that none of the HEI factors other than beliefs in Hawaiian cultural practices proved to be significantly correlated with educational status may suggest an aberrant finding and warrants further investigation to understand this relationship.

Finally, the three dimensions measuring the frequency with which Native Hawaiians engage in culture practices suggests that they are at least partially independent of one another and that Native Hawaiians may elect to participate in some related practices to the relative exclusion of others. This is not surprising as the described practices span the performing arts (e.g., chanting, hula, lei making, Hawaiian language), spiritual and family customs (e.g., family values, child rearing, *lu'au* gatherings), and ocean traditions (e.g., canoe voyaging, surfing, fishing). The significant association between age and ocean traditions was not initially hypothesized and may be due to the relative degree of physical exertion required of several ocean practices such as surfing and diving in which younger Hawaiians are more likely to participate. Involvement in traditional cultural practices, however, most likely involves a host of factors ranging from past modeling by family and significant others to physical ability and personal interest. This logic suggests that individuals who participate in ocean activities such as surfing are more likely to enjoy other traditional ocean activities such as net casting, canoeing, and diving. It does not imply that Native Hawaiians fail to appreciate other cultural practices; rather, that they

may elect to spend their leisure time actively engaged in similar types of practices and perhaps enjoy other practices as observers (e.g., watching traditional hula).

The conceptual structure of the HEI is a theoretical approach for defining Hawaiian ethnic identification based on the transmission of specific knowledge and beliefs derived from performing, experiencing, and/or learning cultural traditions and customs as part of one's lifestyle. Equally important is the extent to which a person continues to carry on these cultural behaviors on a daily basis and throughout one's lifetime because of the influence it has on maintaining or altering interpersonal convictions. When taking into account acculturative factors (Berry, 1993; Phinney, 1993) that inhibit or accelerate the practice of cultural traditions and customs, a person's ethnic identity is undoubtedly vulnerable to change. Thus, the foundation of a person's ethnic association stems from the actual practice of diverse customs and traditions. It is logical to assume that more frequent participation in culturally relevant activities will result in a stronger bond with their ethnic identity. Conversely, relying on a limited appraisal of vocabulary terms, value judgments, and whether or not a person practices certain aspects of culture may no longer be adequate for conceptualizing and assessing ethnic identity. Future research may benefit by incorporating core traditional customs and practices to accurately portray ethnic identity. These traditions entail a broad range of cognitive beliefs that are associated with a range of behaviors such as family activities, spiritual customs, song and dance, arts and crafts, and traditional works. Traditional cultural practices that are quantifiable as independent dimensions may provide a more useful and accurate assessment for estimating group and individual ethnic identity over earlier attempts that relied on surveying a mixture of modern and traditional practices and beliefs to form

single or multiple scales. The utility of this approach may provide a more comprehensive understanding of ethnic identification based on how knowledgeable a person is of particular traditions and customs, the extent of interpersonal attitudes, and how often these cultural behaviors are practiced as part of the lifestyle.

In conclusion, the results of this study support the HEI as a reliable and valid measure of ethnic identity among an adult Native Hawaiian sample. The instrument provides a means of examining ethnic identity across several dimensions of the Hawaiian culture by assessing a person's knowledge of, belief in, and frequent practice of predominantly traditional cultural practices. Collectively, the HEI has adequate psychometric properties and promising potential for use in clinical settings and research involving Native Hawaiians. The strength of the instrument lies in the global assessment of a person's ethnic identity with Hawaiian culture by conceptualizing cultural practices as a core domain. Additional research is needed to examine the HEI's temporal stability, concurrent, discriminative, and predictive validity among Native Hawaiians. Future research in these areas may facilitate the usefulness of the HEI for both theoretical and utilitarian purposes. For example, the inventory may prove useful for determining whether stronger ethnic identity serves as a protective factor for common illnesses, diseases, or stressful life events. Conversely, inappropriate use of the instrument, such as attempting to categorize individuals as Hawaiian or non-Hawaiian or using derived inventory scores to estimate the degree to which one is Hawaiian, is fraudulent and strongly discouraged.

The initial development of the HEI contributes to extant research assessing ethnic identity among Native Hawaiians. A conceptual approach was used to design the

inventory to emphasize cognitive and behavioral dimensions of Native Hawaiian culture. The instrument offers new data that further defines the specific relationships and/or variables of Hawaiian ethnic identity based on cultural practices. This approach expands upon previous research concerning the psychometric validation of Hawaiian identification by assessing individuals' comprehension of, attitudes towards, and degree of participation in Hawaiian cultural practices as part of their lifestyle. The clinical utility and usefulness of the HEI in research involving education, biomedicine, social work, and psychology awaits empirical study.

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Table 1

**Demographic Characteristics among Native Hawaiian and Non-Hawaiian Samples**

<b>Characteristic</b>	<b>Native Hawaiian N = 238 (55.7%)</b>	<b>Non-Hawaiian N = 189 (44.3%)</b>	<b>Total Sample N = 427 (100%)</b>
<b>Ethnic Group</b>			
Caucasian	--	42 (22.2%)	
Chinese	--	10 ( 5.3%)	
Filipino	--	39 (20.6%)	
Hispanic/Latino	--	4 ( 2.1%)	
Japanese	--	45 (23.8%)	
Korean	--	8 ( 4.2%)	
Portuguese	--	5 ( 2.6%)	
Samoan	--	5 ( 2.6%)	
Tongan	--	1 ( .5%)	
Other	--	30 (15.9%)	
<b>NH Blood Quantum **</b>			
0%	--	189 (44.3)	
≤ 24%	48 (11.2%)	--	
25 – 49%	83 (19.4%)	--	
50 – 74%	74 (17.3%)	--	
75 – 100%	33 (7.7%)	--	
<b>Age</b>			
Mean	41.45	38.20	40.01
Stand Deviation	15.91	14.16	15.23
<b>Age Group</b>			
21 – 29 years	66 (15.5%)	67 (15.7%)	133 (31.1%)
30 – 39 years	49 (11.5%)	36 ( 8.4%)	85 (19.9%)
40 – 49 years	52 (12.2%)	40 ( 9.4%)	92 (21.5%)
50 – 59 years	34 ( 8.0%)	31 ( 7.3%)	65 (15.2%)
60 – 69 years	23 ( 5.4%)	11 ( 2.6%)	34 ( 8.0%)
≤ 70 + years	14 ( 3.3%)	4 ( .9%)	18 ( 4.2%)
<b>Gender</b>			
Male	83 (19.4%)	72 (16.9%)	155 (36.3%)
Female	155 (36.3%)	117 (27.4%)	272 (63.7%)
<b>Education Years **</b>			
< 12 years	8 ( 1.9%)	6 ( 1.4%)	14 ( 3.3%)
12 years	55 (12.9%)	23 ( 5.4%)	78 (18.3%)
13 – 16 years	119 (27.9%)	93 (21.8%)	212 (49.6%)
17 – 18 years	33 ( 7.7%)	37 (8.7%)	70 (16.4%)
≥ 19 + years	23 ( 5.4%)	30 ( 7.0%)	53 (12.4%)

\*\* p &lt; .01

Table 2  
Factor Loadings by Items: Factors I, II, III, IV, and V

Question Item	Factor Loadings				
	I	II	III	IV	V
107. To what extent do you believe ho`oponopono or cultural mediation/healing process helps one to connect with the Hawaiian culture?	.794	.111	.053	-.064	-.052
108. Do you believe that traditional spiritual beliefs are an important part of the Hawaiian culture?	.802	-.003	.157	-.034	-.166
109. To what extent do you believe that lomilomi or traditional massage helps a person to identify with the Hawaiian culture?	.805	.118	-.073	.065	-.070
110. How strong is your belief that family values ought to be carried on as part of Hawaiian culture?	.747	-.047	.041	-.097	.165
111. Do you believe the tradition of horticulture or gardening/yard work is an important part of Hawaiian culture?	.788	.061	-.047	.016	-.012
113. To what extent do you believe that interpreting omens helps a person to identify with the Hawaiian culture?	.722	.139	-.022	.074	-.251
116. How strong is your belief in carrying on the practice of hula `auana or modern hula dances?	.763	-.180	.115	-.095	.032
117. Do you believe that lauhala weaving is an important Hawaiian tradition?	.867	-.005	-.011	-.028	.012
119. To what extent do you believe that traditional canoe navigation helps one to connect with the Hawaiian culture?	.845	-.005	-.054	.112	-.062
121. To what extent do you believe that la`au lapa`au or traditional healing helps a person to identify with the Hawaiian culture?	.823	.106	.024	.029	-.118
122. How strong is your belief in carrying on the practice of surfing as part of Hawaiian culture?	.761	-.018	-.237	.267	-.042
123. Do you believe that the practice of hanai or rearing children is an important part of Hawaiian culture?	.767	-.011	-.090	.038	.178
126. Do you believe that preparing and eating traditional Hawaiian foods is an important part of Hawaiian culture?	.843	-.016	-.078	-.087	.096
132. Do you believe that playing an instrument or singing Hawaiian music is an important cultural tradition?	.793	-.106	.044	-.047	.083
136. How strong is your belief in carrying on the practice of raising animals as part of Hawaiian culture?	.685	.163	-.161	.124	-.027
141. Do you believe traditional oli or chanting is an important Hawaiian tradition?	.847	-.068	.174	-.037	-.060
147. Do you believe that la`au gatherings are an important cultural tradition?	.844	.029	-.130	-.047	.096

Table 2 continued  
 Factor Loadings by Items: Factors I, II, III, IV, and V

Question Item	Factor Loadings				
	I	II	III	IV	V
149. How strong is your belief that fishing ought to be carried on as part of Hawaiian culture?	.855	.046	-.113	.058	-.016
150. Do you believe that canoe paddling is an important Hawaiian tradition?	.856	-.076	-.096	.173	-.069
151. To what extent do you believe that planting traditional crops like kalo, sweet potato, and banana ought to be carried on as part of Hawaiian culture?	.836	.052	-.024	-.000	.010
154. How strong is your belief that kapa kuiki or quilt making ought to be carried on as part of Hawaiian culture?	.810	.016	-.068	-.006	.060
156. Do you believe the tradition of giving a person a Hawaiian name is an important part of Hawaiian culture?	.758	-.056	.052	-.041	.061
157. To what extent do you believe that Hawaiian language helps a person to identify with the Hawaiian culture?	.790	-.095	.027	-.067	.032
158. How strong is your belief in carrying on the practice of your family genealogy?	.748	.054	.053	-.066	-.075
160. How strong is your belief that lei making ought to be carried on as part of Hawaiian culture?	.823	-.065	.123	-.092	.062
161. To what extent do you believe traditional hula helps one to connect with the Hawaiian culture?	.798	-.122	.207	-.094	-.019
9. How much do you know about lūau gathering activities and preparations?	-.007	.771	.039	-.149	.068
18. To what extent are you knowledgeable on various patterns used in kapa kuiki or quilt making?	-.056	.595	.102	.077	.013
19. How knowledgeable are you regarding the preparation of traditional Hawaiian foods?	.011	.838	-.022	-.136	.084
25. How knowledgeable are you concerning the kapu or taboos on giving a Hawaiian name for a person?	-.003	.714	.126	-.049	-.099
27. To what extent are you knowledgeable about playing or singing Hawaiian music?	-.082	.637	.181	-.033	.087
28. To what extent are you knowledgeable about techniques for lomilomi or massage?	-.018	.778	-.125	.067	-.026
30. How much do you know about different types of Hawaiian plants?	.001	.818	.010	-.012	-.082
32. To what extent are you knowledgeable about the meaning and interpretation of natural omens and/or signs?	-.012	.661	.099	.095	-.077
35. To what extent are you knowledgeable about or familiar with traditional Hawaiian Christian hymns?	-.125	.742	-.033	-.018	.145
36. To what extent are you knowledgeable about various la`au or Hawaiian herbs and/or plants for healing?	-.057	.873	-.026	-.029	-.093
37. How much do you know about various Hawaiian values like kōkua (to assist or help), aloha (to be compassionate, friendly), hō`ihi (respect, reverence for), and ho`oka`ana like (sharing with others)?	.070	.603	1.49E	-.179	.134
38. How knowledgeable are you regarding the practice of hānai?	.067	.732	.022	-.118	.120

Table 2 continued  
Factor Loadings by Items: Factors I, II, III, IV, and V

Question Item	Factor Loadings				
	I	II	III	IV	V
40. How much do you know about various mo`olelo or stories about your genealogy?	.008	.753	.081	-.085	-.033
41. To what extent are you knowledgeable about types of native fish?	-.001	.801	-.266	.138	-.062
48. To what extent are you knowledgeable about `aumakua or family guardians?	.087	.759	.078	.000	-.042
55. How knowledgeable are you about raising chickens, pigs, cows, and other farm animals?	-.065	.644	-.309	.197	.078
56. How much do you know about the use of lauhala in Hawaiian culture?	.029	.612	.269	.023	-.043
61. How knowledgeable are you regarding the tradition of ho`oponopono or cultural mediation/healing process?	.035	.759	.070	-.107	.022
67. To what extent are you knowledgeable about types of crops farmed by traditional and contemporary Native Hawaiian planters?	.050	.777	-.050	.086	-.093
171. In the past year, to what extent have you participated in Hawaiian oli or chanting activities?	.003	-.008	.840	.117	-.109
177. In the past year, to what extent did you participate in hula `auana or modern hula activities?	-.063	-.073	.999	-.109	-.009
179. In your lifetime, how frequent was hula kahiko or traditional hula a part of your life?	.071	-.035	.847	-.053	.008
185. In your lifetime, how frequent did you speak `olelo Hawai`i or Hawaiian language?	-.044	.267	.498	.181	.020
186. In the past year, to what extent did you participate in lei making activities?	-.056	.059	.721	.015	.118
194. In your lifetime, how frequent was Hawaiian oli or chanting a part of your life?	.067	.070	.779	.083	-.055
198. In your lifetime, how frequent was hula `auana or modern hula a part of your life?	.088	-.040	.826	-.089	.073
207. In the past year, to what extent did you participate in hula kahiko or traditional hula activities?	-.053	-.085	.953	.014	-.018
208. In the past month, how often was lei making a part of your life?	-.051	.063	.590	.118	.168
215. In the past month, how often did you speak `olelo Hawai`i or Hawaiian language?	-.007	.193	.531	.195	-.002
232. In your lifetime, how frequent was lei making a part of your life?	.082	.137	.645	-.060	.060
233. In the past year, to what extent was speaking Hawaiian language a part of your life?	-.022	.239	.529	.167	-.010
234. In the past month, how often did you practice hula kahiko or traditional hula?	-.067	-.070	.966	-.040	-.082
237. In the past month, how often has Hawaiian oli or chanting been a part of your life?	.001	.020	.825	.106	-.086
242. In the past month, how often did you practice hula `auana or modern hula?	-.048	-.061	.927	-.047	-.020
172. In the past month, how often did you participate in canoe voyaging activities?	-.038	-.078	.061	.821	.017
181. In the past month, how often did you go surfing?	-.046	.115	-.109	.715	-.019

Table 2 continued  
 Factor Loadings by Items: Factors I, II, III, IV, and V

Question Item	Factor Loadings				
	I	II	III	IV	V
188. In the past month, how often was hoe wa`a or canoe paddling a part of your life?	.040	-.213	.062	.800	.086
192. In the past month, how often did you go to the mountains, seashore, or a heiau for prayer or meditation as part of your life?	-.016	.178	.182	.353	.176
200. In your lifetime, how frequent did you go surfing?	.059	.111	-.114	.664	-.044
211. In the past year, to what extent did you participate in canoe paddling activities?	.010	-.190	.137	.852	.000
222. In the past year, to what extent has canoe voyaging activities been a part of your life?	-.060	-.021	.087	.783	.010
223. In your lifetime, how frequent was hoe wa`a or canoe paddling a part of your life?	.110	-.039	.185	.656	-.059
224. In the past month, how often did you go fishing?	-.079	.177	-.213	.609	.139
228. In the past year, to what extent did you surf?	.002	-.035	-.029	.798	-.015
238. In your lifetime, how frequent did you participate in canoe voyaging activities?	-.016	.119	.144	.675	-.054
163. In your lifetime, how frequent was going to church, reading the bible, and prayer a part of your life?	-.118	.108	-.111	-.128	.690
178. In the past month, how often was the tradition of hanai (rearing children) a part your life?	.024	-.044	.024	.158	.709
190. In the past year, to what extent was going to church, reading the bible, and prayer a part of your life?	-.122	-.065	.004	-.056	.797
203. In your lifetime, how frequent was the tradition of hanai (rearing children) a part your life?	.060	.058	-.022	.107	.676
205. In the past year, to what extent did you either go to or participate in lu`au gathering activities?	.134	.125	.111	.166	.362
214. In the past year, to what extent did you and your family practice family gatherings, caring for others respecting elders, and sharing as part of your life?	.259	.052	.104	-.107	.568
226. In the past month, how often was going to church, reading the bible, and prayer a part of your life?	-.106	-.038	-.046	-.027	.758
230. In the past month, how often did you and your family practice family gatherings, caring for others, respecting elders, and sharing a part of your life?	.149	.032	.084	-.029	.618
231. In the past year, to what extent was the tradition of hanai (rearing children) a part your life?	-.061	-.044	-.023	.211	.696
Eigenvalues	26.08	10.30	5.04	4.47	3.25
% Variance explained	32.60	12.87	6.30	5.59	4.06
Cumulative %	32.60	45.48	51.78	57.37	61.44
Alpha coefficient	.97	.95	.96	.89	.85

Table 3

Mean Comparisons of HEI Factor Scores between Native Hawaiian and Non-Hawaiian Samples

	KHCP**			BHCP**			FPA**			FOT**			FSFC**		
	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
NH	49.96	15.93	1.03	107.77	19.48	1.26	38.28	17.42	1.13	18.56	8.39	.544	27.71	8.45	.548
Non-Hawn	35.31	11.92	.867	92.06	25.23	1.83	26.39	12.68	.922	15.63	6.16	.448	22.85	8.68	.631
Total	43.48	16.03	.775	100.82	23.52	1.14	33.02	16.57	.802	17.26	7.62	.369	25.56	8.88	.429

*SE* = Standard Error of Mean\*\* significant  $p < .01$



Table 4  
 One-Way ANOVAs: HEI Factor Scores by BQ, Age, and Education Groups

Demographic Variable	HEI Factor Scores				
	KHCP	BHCP	FPA	FOT	FSFC
BQ	$F(3,234)=8.298, p<.001$	NS	NS	NS	NS
Age Group	NS	NS	NS	$F(5,232)=3.754, p<.005$	NS
Education Group	NS	$F(4,233)=3.584, p<.01$	NS	NS	NS

$N = 237$

NS Non-significant effects

Native Hawaiian Sample only

Table 5

Post-hoc Analyses: Mean HEI Factor Scores by BQ, Age, and Education Groups

Demographic Variable	KHCP		BHCP		FPA		FOT		FSFC	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
<b>BQ</b>										
1-24%	43.64	13.71	----	----	----	----	-----	-----	----	----
25-49%	48.18	14.36	----	----	----	----	-----	-----	----	----
50-74%	51.51	16.12	----	----	----	----	-----	-----	----	----
75-100%	60.15	17.32	----	----	----	----	-----	-----	----	----
<b>Age</b>										
21-29 yrs.	-----	-----	----	----	----	----	20.33	7.90	----	----
30-39 yrs.	-----	-----	----	----	----	----	18.36	7.82	----	----
40-49 yrs.	-----	-----	----	----	----	----	20.56	9.86	----	----
50-59 yrs.	-----	-----	----	----	----	----	17.05	8.11	----	----
60-69 yrs.	-----	-----	----	----	----	----	14.00	3.58	----	----
70+ yrs.	-----	-----	----	----	----	----	14.42	4.81	----	----
<b>Education</b>										
< 12 yrs.	-----	-----	101.00	24.64	----	----	----	-----	----	----
12 yrs.	-----	-----	100.87	21.47	----	----	----	-----	----	----
13-16 yrs.	-----	-----	108.58	18.95	----	----	----	-----	----	----
17-18 yrs.	-----	-----	115.00	12.30	----	----	----	-----	----	----
>19 yrs.	-----	-----	112.08	19.50	----	----	----	-----	----	----

Significant post-hoc analyses computed using Tukey's B.