The goal of this paper is to discuss stress, coping, and health concepts which appear to have the greatest promise for informing and guiding future research among Indian and Native populations. To facilitate this discussion a model was selected which allowed the authors to incorporate a wide range of interacting variables at one time. This model was chosen on the basis of an assessment of the limited exchange between the research which has focused on Indian and Native health problems, and that which has investigated stress and coping relationships with respect to health outcomes. If the current literature is any indication, it seems a fair assessment that those who are most familiar with Indian and Native health research have limited knowledge of the stress, coping, and health literature. Conversely, those with extensive backgrounds in studying stress, coping, and health relationships have paid little attention to Indian and Native health concerns. Consequently, this paper tries to achieve a balance by selectively presenting both literatures and showing their relevance to one another.

Few empirical studies have used stress and coping variables in Indian and Native health research. By contrast, there is an extensive theoretical and empirical literature on stress, coping, and health relationships, albeit one that does not appear to give equal attention to the specific links in the three-way interaction between each of the variables. The relationships between stress and coping and between stress and health are quite fully developed (Elliott & Eisdorfer, 1982). The relationship between coping and health is less fully developed but examination of this link appears to be an area of robust research activity (Gentry & Kobasa, 1984; Ursin, 1980). This paper will focus on the linkages between stress, coping, and health outcomes as one of the more salient issues for future research among Indian and Native populations.

The models reviewed incorporate a bewildering array of stress and coping variables that can influence health outcomes. Those variables potentially more useful to the other papers to be presented at this conference have been emphasized. It was the authors’ goal to assist other authors insofar as they were considering the influence of stress and coping variables in regard to specific diseases or health care concerns among Indian and Native populations (e.g., the role of stress in adult onset diabetes, issues of long-term care).
The current literature on Indian and Native health research provides a weak foundation from which future studies can attempt to systematically incorporate stress and coping variables in the investigation of health outcomes. This paper attempts to show the relevance of stress and coping variables by suggesting the manner in which they could have been used to inform past studies and their potential for incorporation in future studies of Indian and Native health. When relevant, studies of other culturally different populations have also been cited, with respect to the role of stress and coping variables in health outcomes. These studies should not, of course, be taken as directly generalizable to Indian and Native populations, but rather as empirically based guides for future replication and extension studies which use stress and coping variables. The paucity of empirical studies which have combined sociocultural variables along with stress and coping variables in their design is a compelling demonstration of the research frontier that lies ahead for health and behavior research among Indian and Native populations.

The plan of this paper is to begin with a brief overview of health statistics which suggest that an epidemiological transition is underway, in which degenerative and "lifestyle" diseases are becoming a prominent aspect of Indian and Native health patterns. A general model of the stress process is then reviewed, which includes internal and external mediators of health outcomes. Subsequently, some important future research topics are focused on, which have been identified as pertinent to health and behavior relationships involving stress and coping variables. The paper concludes with recommendations for priority research issues for Indian and Native populations.

**Brief Overview of Trends in Morbidity and Mortality Among Indian and Native Populations**

An examination of disease patterns and vital statistics in the Indian and Native population since the 1950s shows a shift from acute, infectious diseases to chronic, degenerative, and lifestyle-related diseases as leading causes of morbidity and mortality, especially among adults. This trend has been termed the "epidemiologic transition" and refers to the change in the type and relative importance of diseases that cause the majority of a society’s deaths as it undergoes modernization (Corruccini & Kaul, 1983; Omran, 1971). Evidence that such a transition is occurring will be briefly reviewed using vital statistics on causes of death and Indian Health Service reporting systems data on ambulatory patient care.
**Trends in Mortality and Morbidity**

Mortality from infectious diseases has declined dramatically since the IHS was first established in 1955. Deaths from pneumonia and influenza, tuberculosis, and gastrointestinal diseases have decreased by 79%, 95%, and 79%, respectively (Table 1).

<table>
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</thead>
<tbody>
<tr>
<td>Gastrointestinal disease</td>
<td>15.8</td>
<td>7.6</td>
<td>3.4</td>
<td>-78.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>55.8</td>
<td>12.5</td>
<td>2.9</td>
<td>-94.8</td>
<td>3.3</td>
</tr>
<tr>
<td>Pneumonia &amp; influenza</td>
<td>91.9</td>
<td>47.6</td>
<td>19.6</td>
<td>-78.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Accidents</td>
<td>155.6</td>
<td>181.8</td>
<td>100.3</td>
<td>-35.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Chronic liver disease &amp; cirrhosis</td>
<td>15.8</td>
<td>56.9</td>
<td>37.0</td>
<td>+134.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Suicide</td>
<td>9.4</td>
<td>18.2</td>
<td>14.7</td>
<td>+56.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Homicide</td>
<td>16.1</td>
<td>23.2</td>
<td>16.9</td>
<td>+5.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>14.3</td>
<td>26.1</td>
<td>21.1</td>
<td>+47.6</td>
<td>2.1</td>
</tr>
<tr>
<td>Diseases of the heart</td>
<td>134.1</td>
<td>168.8</td>
<td>139.0</td>
<td>+3.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>45.9</td>
<td>55.0</td>
<td>28.0</td>
<td>-39.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Hypertension</td>
<td>N/A</td>
<td>1.7</td>
<td>2.1</td>
<td>+23.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>62.0</td>
<td>79.5</td>
<td>77.6</td>
<td>+25.2</td>
<td>0.6</td>
</tr>
</tbody>
</table>


After peaking in the 1970s, death rates due to accidents and cerebrovascular disease have declined compared to 1955, death rates due to homicide and diseases of the heart are about the same as in 1955, and death rates due to chronic liver disease and cirrhosis, suicide, diabetes, hypertension and malignant neoplasms have increased. Thus, infectious conditions have receded as important causes of mortality, while lifestyle-related causes of death have become predominant.

Despite the declines in death rates of tuberculosis, pneumonia and influenza, and accidents, these rates are still substantially higher than those of the U.S. All Races population. Death rates due to suicide, homicide, diabetes, chronic liver disease and cirrhosis are also higher among Indians and Natives, while death...
rates from cancer and three major cardiovascular diseases are lower. Hypertension is the only major cardiovascular disease for which the death rate among Indians is greater than among U.S. All Races.

Table 2 compares the leading causes of death among Indians with those for U.S. All Races. A much greater proportion of the deaths in the U.S. All Races population is attributable to heart disease, cancer, and cerebrovascular disease. These dissimilar patterns are attributable in part to differences in the age structures of the populations and also to differences in the ages at which the majority of deaths occur. The Indian population is much younger (45% of Indians are <20 years old vs. 32% of the general U.S. population) and a much larger proportion of deaths among Indians occur before age 65 (62% vs. 32.6%).

### Table 2

<table>
<thead>
<tr>
<th>Causes</th>
<th>% Distribution</th>
<th>Causes</th>
<th>% Distribution</th>
</tr>
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<tbody>
<tr>
<td>Heart disease</td>
<td>21.4</td>
<td>Heart disease</td>
<td>38.3</td>
</tr>
<tr>
<td>Accidents</td>
<td>18.2</td>
<td>Malignant neoplasms</td>
<td>22.0</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>11.5</td>
<td>Cerebrovascular disease</td>
<td>8.0</td>
</tr>
<tr>
<td>Chronic liver disease &amp; cirrhosis</td>
<td>5.4</td>
<td>Accidents</td>
<td>4.8</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>4.7</td>
<td>Chronic obstructive pulmonary disease</td>
<td>3.0</td>
</tr>
<tr>
<td>Pneumonia &amp; influenza</td>
<td>3.5</td>
<td>Pneumonia &amp; influenza</td>
<td>2.5</td>
</tr>
<tr>
<td>Homicide</td>
<td>3.2</td>
<td>Diabetes mellitus</td>
<td>1.8</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>3.1</td>
<td>Chronic liver disease and cirrhosis</td>
<td>1.4</td>
</tr>
<tr>
<td>Suicide</td>
<td>2.8</td>
<td>Atherosclerosis</td>
<td>1.4</td>
</tr>
<tr>
<td>Perinatal conditions</td>
<td>2.2</td>
<td>Suicide</td>
<td>1.4</td>
</tr>
</tbody>
</table>


A different picture emerges if causes of death in the Indian and U.S. populations are compared within specific age groups. First, the All Cause death rate is higher among Indians for all age groups except those age 65 years and older, in which it is lower. This "cross-over" phenomenon is observed also in the non-White U.S. population. Second, in the Indian population age 65 and older, the leading causes of death (diseases of the heart, malignant neoplasms, cerebrovascular disease, influenza and pneumonia, accidents, and diabetes) are similar to those in the U.S. population age 65 and older. As the Indian population ages and the proportion of deaths occurring in the older age groups increases, these degenerative diseases may be expected to assume more prominence as causes of death in the population as a whole. Third, while the suicide rate among all Indians is only slightly higher than among the U.S. All
Races, suicide rates among Indians age 15 to 44 are 2 to 4 times higher than the same age groups in the U.S. population, and are 1.5 to 2 times lower in those age 55 and older (Department of Health and Human Services, 1985).

Outpatient visits also reflect an increasing role of chronic degenerative disease in the health profile of Indians and Natives. Diabetes and hypertensive disease were the second and fourth leading diagnoses in IHS facilities in 1984 (DHHS, 1985).

Implications

A major deficiency of data aggregated from all reservation states is that they obscure tribal- and area-specific patterns and trends. For example, age-adjusted mortality rates for accidents, influenza and pneumonia, and tuberculosis are higher among the Navajo as compared to all U.S. Indians, while heart diseases, cerebrovascular disease, diabetes, cancer, cirrhosis, and homicide are lower (Broudy & May, 1983). Likewise, risk for gallbladder cancer is much higher among Indians than in the general U.S. population, but within the Indian population, the risk is much higher among tribes in the southwestern U.S. than for tribes of Oklahoma (Sievers & Fisher, 1981). These variations suggest the need for studies of the unique features of each region which contribute to the observed trends and patterns. They also suggest that decentralized planning for health promotion and disease prevention is crucial to the development and implementation of health plans which meet the health needs of specific communities.

Of particular concern is the extent to which the patterns of morbidity and mortality observed among Indian and Native populations may be related to environmental stressors. Stress has been implicated as a causal, precipitating, or perpetuating factor in virtually all of the disease categories described above (Bunney & Shapiro, 1982). Sources of morbidity and mortality which are prevalent among Indians and Natives, such as alcohol abuse and suicide, are clearly among these categories. Alcohol abuse may reflect maladaptive coping responses to a variety of environmental stressors that in turn contribute to mortality from accidents, suicide, homicide, liver diseases, and cirrhosis. Alcohol use also has been related to hypertension among Navajos (DeStefano, Coulehan, & Wiant, 1979) and in non-Indian populations (McQueen & Celentano, 1982). Suicide, likewise, has been viewed as a result of inability to cope with environmental stressors. The concentration of suicides among young and middle-aged Indians and Natives may reflect this process at work, although separating etiological from precipitating factors can be very difficult.

The interaction between stress and coping responses has also been implicated in the etiology of hypertension. Death rates from hypertension appear to be somewhat higher among Indians than U.S. All Races. Among Navajos, young
men between 20 and 30 years of age had higher prevalence rates of elevated blood pressure than any other Navajo age group, and higher rates than same age Blacks or Whites (DeStefano et al., 1979). Alfred (1970) reported that the blood pressure levels of Navajo males who migrated to an urban area were higher than their levels while they resided on the reservation. Likewise, stress and coping interactions are considered to play an important role in major mental diseases such as schizophrenia and depression, the latter of which is suspected to be quite high and strongly correlated with alcohol abuse in Indian and Native populations. Although there is no convincing evidence that environmental stressors are etiological agents in diabetes, stress may be a precipitating factor and the failure to adequately cope with the disease may significantly influence treatment and the subsequent life course of the patient. Increases in major cardiovascular diseases and cancer also appear to be part of the epidemiological transition among Indian and Native populations. Although the role of stress and coping in relation to these diseases has been extensively studied in other populations, this relationship is completely unexplored among Indians and Natives.

The epidemiologic transition underway among Indian and Native populations, requires adjustments in approaches to diagnosis, treatment, and prevention of disease. Attention should be given to the influence of stress and coping factors in this transition. The next section of this paper attempts to provide a conceptual framework with which to examine these and other factors in relation to health and behavior issues of concern among Indians and Natives.

A General Paradigm of the Stress Process

This section will selectively review the literature on stress, coping, and health relationships as a means of providing a context for a general discussion of health and behavior relationships. A conceptual framework, which helps to integrate a great deal of what has been written about stress, coping, and health outcomes, will be discussed. The components of the framework will be related to the relevant literature on Indian and Native populations.

A number of conceptual frameworks were reviewed in attempting to find one that incorporated a variety of psychosocial factors that could be related to health outcomes. There is a wide and bewildering array of schemata for depicting the relationships of stressful psychosocial stimuli to coping processes that are hypothesized to mediate health outcomes, and each has certain advantages and disadvantages (e.g., Aakster, 1974; Antonovsky, 1980; Jenkins, 1979; Kagan & Levi, 1974; Levi, 1974, 1979; Moos, 1984).
The study panel which focused specifically on stress and life events as their contribution to the National Academy of Sciences volume, *Stress and Human Health* (Dohrenwend, Pearlin, Clayton, & Hamburg, 1982), produced a general paradigm of the stress process expanded from a prior model to include antecedents of stressful life events (Dohrenwend & Dohrenwend, 1981; Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978; Dohrenwend et al., 1982). This model identifies environmental circumstances and person factors as the antecedents of stressful life events. Experiencing stressful life events in turn leads to a state of stress. Depending on the interaction of both internal and external mediators with the state of stress, positive, neutral, or negative health outcomes may result. The authors found this model to be the most useful for depicting stress, coping, and health relationships which could be discussed with reference to Indian and Native populations (Figure 1).

![Figure 1. General paradigm of the stress process extended to include antecedents of stressful life events.](image)

**Figure 1.** General paradigm of the stress process extended to include antecedents of stressful life events.

**Note.** From *Stress and Human Health* by B.P. Dohrenwend et al., 1982. NY: Springer.

**Environmental Circumstances**

The environmental circumstances in this model include a wide range of physical and psychosocial stimuli identified as predisposing factors for human stress. Included in such stimuli are geographic and architectural characteristics,
climate, organizational size and structure, cultural belief systems, generalized social expectancies, forced relocation, institutionalized means for dealing with social change, economic upheaval, and natural disasters (Cohen et al., 1982). Surprisingly few of these factors have been specifically identified as predisposing stressors for Indian and Native populations, although there is a small but significant literature on other cultural groups. Cassel and colleagues were among the first to discuss the stressful effects of culture change with respect to health and epidemiological implications (Cassel, Patrick, & Jenkins, 1960; Cassel & Tyrold, 1961).

Numerous studies have since been published with respect to the presumably negative effects of uprooting, migration, and relocation (e.g., Cassel, 1974, 1976; Coelho & Ahmed, 1980; Fried, 1980; Hinkle, 1974; Marris, 1980; Trimble, 1980) and a whole subclass of such studies which deal with the stressful effects of role transitions has been described (e.g., Hornth, 1984; Rosch & Irle, 1984; Sokol & Louis, 1984; Strasser, 1984). Although weak in empirical base, most such studies conclude that uprooting, migration, and relocation generally have negative effects on mental health, while Kasl and Berkman (1983) recently reviewed studies of the consequences of migration and concluded that major cross-cultural transitions are not associated with major negative consequences in physical health status or biological indicators. Despite such conclusions, the examination of cultural factors and culture change as a source of influence on health status has been and continues to be an active area of research, most notably with respect to coronary heart disease (Bruhn, Chandler, Miller, Wolf, & Linn, 1966; Gerber, 1980; Gerber & Madhavan, 1980; Marmot & Syme, 1976; Yano et al., 1979), hypertension (James & Jenner, 1983; McGarvey, Schendel, & Baker, 1980; Stavig, Igra, & Leonard, 1984; Ward & Prior, 1980), diabetes (O’Dea, Spargo, & Akerman, 1980), and other stress-related biological outcomes (e.g., Brown, 1981; James & Jenner, 1983). Although these studies are of limited generalizability for Indian and Native populations, they do suggest that cultural variables are potentially important sources and mediators of stressful life events.

A recent report on the social impact assessment of accelerating energy extraction and other industrial developments, which could bring about forced relocation among the Navajo, provides a good example of some of these cultural factors (Schoepfle, Burton, & Begishe, 1984). Schoepfle et al. used ethno-science, ethnography, and survey research methods to obtain a description of what Navajos consider when deciding how to cope with energy development. The ethnographic portion of the study described three major threats to the Navajo way of life that would result from forced relocation, reduction of livestock, or denial of access to traditional lands. According to various sources, the following would be the primary results: (a) without livestock (primarily
sheep) the Navajo would be denied the primary means of reciprocal economic and social exchange, as well as a means by which to socialize their children. Long-range plans for their children to inherit their livestock and land, and thereby carry on important traditions, were also linked directly to possessing livestock (Begishe, 1982). Livestock reduction also meant that many forms of social exchange embodied in the Navajo term K’e (Witherspoon, 1974) would be seriously curtailed if sheep and mutton could not be exchanged or given to people in need, and (c) the breakdown of social ties would occur by being segregated through forced relocation, or denied access to traditional lands through fencing. Concern was also expressed about the depressing loneliness of either living among strangers in border towns or of having to impose upon Navajos elsewhere on the reservation, whose own hopes for passing on or inheriting land would be decreased by the arrival of newcomers (Scudder, 1982).

Thus, threats to lifestyle, kinship, land, animals, housing, and sacred places were among the potential stressful environmental circumstances identified by ethnographic analysis. The results of the survey research results on the same population will be reserved to illustrate cross-cultural variations in stressful life events perceptions in the following section.

**Person Factors or Predisposing Factors**

Individual variability in patterns of stress reactions to the same presumed stressful stimuli has proven to be a consistent problem in the stress and coping literature. Chan (1977) proposed that some consistent personality and attitudinal constructs like self-esteem, externality-internality, learned helplessness, a potent sense of hope and efficacy, and anxiety, all of which he viewed as end-products of a long socialization process, might promise to explain the reactional differences observed among individuals under stress. Recent reviews (e.g., Baum & Singer, 1982; Cohen, 1980; Gentry & Kobasa, 1984; Ursin, 1980) have examined both the predispositional and protective aspects of individual variations in vulnerability to the negative effects of stressful life experiences and reached similar conclusions, even though the mediating mechanisms by which personality factors may produce positive, negative, or neutral health outcomes have not been specified.

Despite the potential role of ethnicity and cultural identification as important predispositional or protective aspects of variability in stress reactions, there has been surprisingly little research regarding such factors among Indian and Native populations. One study of Alaskan Inuit (Chance, 1965) reported that high stress was associated with the incongruous combination of high identification with Western life, and low amount of contact with Western culture; low stress was associated with congruence between identification and contact. Alfred (1970) presented data supporting significant differences in blood pressure, considered
by some to be the cross-cultural indicator par excellence of the cumulative effects of stress (Kasl & Berkman, 1983), of Navajo migrants to the city and those who stayed on the reservation. Other studies have indicated that both exaggerated acculturation and exaggerated maintenance of ethnic identity may be associated with pathology (e.g., drug abuse, abuse of nonprescription sedatives) (Szapocznik & Kurtiness, 1980). We will have more to say about personal factors as antecedents of stressful life events in later sections which deal with specific research topics.

**Stressful Life Events**

Although there has proven to be a relatively weak relationship between life events and changes in health status (Dohrenwend & Dohrenwend, 1981), investigation of stressful life events as risk factors in predicting disease continues to be an area of active research (e.g., Billings & Moos, 1982). The recent shift in emphasis in such studies has been from the weighing of combinations of life events which may be associated with negative health outcomes to more focused examination of life stress processes which attend to both personal dispositions and the psychosocial context of life events. Figure 2 depicts six hypotheses (i.e., victimization, stress-strain, vulnerability, additive burden, chronic burden, and event proneness) that various investigators have developed about the life stress process and adverse health changes.

The **victimization** hypothesis is basic to the notion that the occurrence in a short period of time of a number of severely stressful life events can produce adverse health changes. This model underlies and was supported by the early work of Holmes, Rahe and colleagues (Holmes & Masuda, 1974; Rahe, 1974). It was developed empirically from studies of extreme situations such as combat and concentration camps and has been generalized to civilian life for situations such as forced relocation in which the individual has little or no control over the events in their life.

The **stress-strain** hypothesis proposes that psychophysiological strain mediates the impact of life events and was derived from work by Garrity, Somes, and Marx (1977). They appraised personality factors derived from the Omnibus Personality Inventory and found various personal factors which influenced the extent of reported life change, stress symptomatology, and illness experience. For example, the personality variables of intellectualism and sensitivity were positively associated with both life change and strain. The stress-strain hypothesis also reflects the theory that certain self-esteem-threatening life events will elicit from predisposed individuals a Type A response pattern. Moreover, loss events are predicted to elicit a helpless/hopeless response from some individuals that, in the presence of environmental pathogens or physiological vulnerability, lead to illness.
Figure 2. Six hypotheses about the life stress process.

The vulnerability hypothesis indicates that associations between life events and adverse health changes are moderated by pre-existing personal dispositions and social conditions that make an individual vulnerable. The stress-strain hypothesis is actually considered a variant of the vulnerability hypothesis, which incorporates concepts such as coping ability and social support.

The additive burden hypothesis also emphasizes the importance of personal dispositions and social conditions. However, it differs in that personal dispositions and social conditions are hypothesized to augment the impact of stressful life events rather than moderating them as in the vulnerability hypothesis.

The chronic burden hypothesis is also a modification and extension of the vulnerability hypothesis and actually minimizes the role of stressful life events in relation to health outcomes. This model proposes that stable personal dispositions and social conditions rather than transient stressful life events cause adverse health changes.

Finally, the event proneness hypothesis proposes that the presence of a disorder leads to stressful life events, which in turn exacerbate the disorder. This hypothesis raises the crucial issue of the direction of the causal relation between life events and symptoms of illness. It is likely that this hypothesis could be useful in explaining both chronic illness and acute adverse health changes.

The authors found only one study which used Indian subjects in studying stressful life events. Unfortunately, this study was more general in purpose and did not relate stressful life events to health outcomes. Liberman and Frank (1980) used the Social Readjustment Rating Scale (SRRS) (Holmes & Rahe, 1967) to examine perceptions of the amount of life changes that would be produced by stressful life events of 66 adult Miccosukee and compared these perceptions with those of a mixed race sample from North Carolina and a group of urban White, middle-class subjects from the Pacific Northwest. The results indicated that the Miccosukee sample tended to report higher levels of stress to most SRRS items than the other two groups. For example, the Miccosukee sample gave significantly higher rankings to items such as "death of a friend" and "minor violation of the law." The only item which maintained a consistent ranking was "death of a husband or wife," which ranked first across the three groups. Factor analysis produced similar factors for the three groups (e.g., life space change, personal lifestyle change, death) but, with the exception of "death," the definition of the concepts by the inclusion of different items in the factors varied considerably. One factor, labeled "dissolution of relationships," that occurred within the Miccosukee sample, did not contain any items in common with the other two groups. This factor focused on changes that would probably be produced by outside forces or forces alien to the traditional culture, such as changes in family get-togethers, moving to a different reservation,
moving to town, or changing to new schools. The outcomes of this study suggest both similarities and differences in the perceptions of life events by a tribal sample and non-Indian comparison samples. Although the results suggest that the life events approach to studying stress can be successfully applied among Indian and Native populations there are no data that link such events to health outcomes.

Since the overwhelming number of studies of life stress and adverse health changes indicate a positive but weak relationship (Dohrenwend & Dohrenwend, 1981), it is questionable if future research on this relationship among Indian and Native populations is justified. If one chooses to do exploratory research, the various hypotheses about the nature of the processes underlying such a relationship which were discussed above would serve as a useful guide for those embarking upon replication studies with Indian and Native populations.

As indicated by the Liberman and Frank study (1980), one critical concern in using a stressful life events approach with Indian and Native populations is the cross-cultural differences that have been found in the perceptions of presumably objective stressful events of universal significance. Fairbank and Hough (1981) reviewed studies which employed the Social Readjustment Rating Scale with culturally different populations and came to a number of conclusions about both substantive and methodological issues. Among such issues are the disproportionately homogeneous upper class samples of convenience that have been used in making cross-cultural comparisons. There has been a general failure to sample a range of social classes within cultures, thus making it difficult to determine whether similarities or differences in the perceptions of life events are due to cultural or social class effects. Another significant methodological problem has been the lack of translation and instrument construction procedures to assure some degree of consistency across cultural groups, as well as the probability of the difficulty of the rating task introducing error variance among lower class groups. Reviews of relevant instruments for studying life events and health change are instructive in this regard (e.g., Kale & Stenmark, 1983; Weissman, Sholomskas, & John, 1981).

Of equal concern has been the exploratory and atheoretical nature of much of the cross-cultural research to date, in spite of the likelihood that cultural differences in reaction to life events tend to be specific. For example, Kasl and Berkman (1983) argued that there are so many dimensions and aspects to cross-cultural migration phenomena that may potentially influence various outcomes, that it would be prudent to view each migration as unique. One might also conclude that it would be prudent to have a tribal-specific life events scale rather than a pan-Indian/Native scale to relate to health outcomes (e.g., Miller, 1980). Fairbank and Hough (1981) argued that future studies could achieve more useful results by concentrating on testing theoretical notions of how life
event ratings varied across cultures, and suggested that specific hypotheses be developed with regard to the fit between what is regarded as particularly threatening in different types of cultures and what is rated as important in terms of life change requirements.

The Schoepfle et al. (1984) study cited above provides an excellent example of the importance of such methodological difficulties in the study of stressful life events and adverse health changes when applied to Indian and Native populations. Although Schoepfle and colleagues were attempting to examine Navajo scales of stressful life events, the data resulting from the survey portion of their study serves as a good indication of how the relative weights and rankings of life events may be quite different depending on the context of the study. Using entailment analysis, to examine survey results with respect to energy development and change, revealed that the entailment structure had only one head item: "Grazing permits will be invalidated." This crucial item was the most threatening possible outcome (and a presumably very stressful one) and was linked to each of the other major dimensions of concern—lifestyle, kinship, land, animals, housing, and sacred places. Since most prior attempts to scale life events (e.g., Taussig, 1982) have started with item pools based on variants of the Schedule of Recent Events (Holmes & Rahe, 1967) and the Recent Life Changes Questionnaire (Rahe, 1974), it is doubtful that such an approach would adequately represent the reality of the degree of individual and collective stress in Indian and Native communities. Although Liberman and Frank (1980) found major similarities and small but culturally plausible differences in life events perceptions among Indian and non-Indian samples using the Holmes/Rahe items, it is likely that the differences would have been considerably greater had the item pool been generated from the type of concerns reflected in the Schoepfle et al. study.

The State of Stress

The authors would be in very prestigious company indeed if they chose to side-step conceptual issues in the definition of human stress (e.g., Cassel, 1974; Goldberger & Breznitz, 1982; Kasl, 1984). These conceptual problems have been grappled with in the past (Mason, 1975) and will continue to be confronted in the future. A continuing problem has been that the evolving definitions of stress have not gotten much beyond the early difficulties in distinguishing between the wide range of stimulus and response connotations of the stress concept. Kasl (1984) indicated that "stress" continues to be used in several fundamentally different ways, but that the following four classes of variables encompass its different uses in referring to: (a) selected environmental conditions and experiences, (b) variables thought to be reactions to such environmental conditions, (c) indicators of distress or tension, whether or not they are
linked to any particular environmental condition, and (d) stable personal traits or characteristics that may be linked with chronic or repeated exposure or with reactions of distress and tension.

With regard to usages a, b, and c, no less a theorist than Selye (1982) pointed out the following:

One of the first things to bear in mind about stress is that a variety of dissimilar situations—emotional arousal, effort, fatigue, pain, fear, concentration, humiliation, loss of blood, and even great and unexpected success—are capable of producing stress; hence no single factor can, in itself, be pinpointed as the cause of the reaction of such. (p. 7)

Although there are continuing attempts to integrate the complementary aspects of the biological and psychosocial aspects of stress (e.g., Fleming, Baum, & Singer, 1984) there are also indications in the current literature of an unwillingness to continue struggling in making "stress" a precise scientific concept within a formal theory with specific linkages to other constructs. Kasl (1984) has concluded that it would be more productive to work on improving research design methodology with respect to strong inferences regarding causal pathways, to identify underlying mechanisms and mediating processes, and to develop interpretable measures of health impact resulting from stress. We would concur with this conclusion and suggest that to reinvent the wheel by attempting to define "stress" in specific relation to Indian and Native populations would be a largely futile pursuit. The limited research resources available for Indian and Native populations would be much better spent by concentrating on examining the internal and external mediators of stressful life events with respect to different health outcomes.

Internal and External Mediators of Stress

The general paradigm of the stress process presented in Figure 1 proposes that both internal and external mediators of the state of stress influence physical and mental health outcomes. We have chosen to devote the greatest amount of attention to such mediating variables and do so in the discussion of specific research topics in later sections of this paper. In those sections we will attempt to summarize the current literature with respect to a number of prominent topics and to draw implications for stress, coping, and health research among Indian and Native populations. For this paper we have selected topics that were addressed originally in the "Stress, Coping and Health" chapter (Hamburg, Elliott, & Parron, 1982) which appear to have clear significance for health and behavior relationships among Indian and Native populations (e.g., social support and stress buffering, perceived control and stress outcomes, decision making in health-related circumstances).
We did not undertake an examination of coping as a specific internal mediator of stress and health relationships. Our review of the literature in this area indicated that there has been little attention given to coping as a variable in Indian and Native health research and no studies have systematically incorporated it as a mediating variable in stress and health outcome research. This is surprising insofar as coping has been incorporated in a number of recent attempts to study stress and illness relationships (e.g., Billings & Moos, 1982, 1984; Cohen, 1980; Cohen & Lazarus, 1980; Gentry & Kobasa, 1984; Lazarus & Folkman, 1984; Moos & Billings, 1982).

Changes in Health Status—Mediated and Unmediated Effects

The end result of the general stress paradigm includes positive, neutral, or negative effects on the health status of the individual. Neutral or nonsubstantial change is only of consequence when the predicted adverse or beneficial effects of exposure to known stressors fails to occur. Such outcomes could indicate that external or internal mediators, or a combination of both, had neutralized potential adverse health outcomes and would have considerable protective and preventive health implications.

Of potentially greater concern would be the undesirable changes in functioning or health which appear to be the well-documented effects of exposure to stressors. For example, the National Academy of Science’s panel on stress and illness adopted an organ-systems approach to examining the large and diverse array of evidence for an effect of stress on the predisposition to, precipitation of, and perpetuation of a number of major physical and mental disorders (Bunney & Shapiro, 1982). Although early stress and health change studies lacked both theoretical and methodological sophistication, there is clearly enough data from both animal and human studies to implicate stress in a variety of negative health outcomes such as gastrointestinal disorders, cardiovascular disease, hypertension, immune disease, cancer, endocrine disease, pulmonary disease, major mental disorders, and alcoholism and drug abuse. The majority of these disease categories are also present to substantial degrees in Indian and Native populations but research on the role of stress as a predispositional, precipitating, or perpetuating factor is virtually non-existent in the available literature.

Attention has also been given to the positive side of stress outcomes in terms of the potential protective or health-promoting effects of stress (Bunney & Shapiro, 1982). Past stress research has focused almost entirely on the adverse consequences of stressors, and has largely ignored the possibility of desirable consequences for either physical or mental health. Although there are those who have argued on theoretical grounds against the bipolar conceptualization of stress which allows that some levels or types of stress are associated with health benefits (e.g., Kasl, 1984), some studies indicate that certain life experiences and
constellations of personality factors are associated with increased coping capacity and may influence host resistance to life stresses. The Kobasa studies (Kobasa, 1979; Kobasa, Maddi, & Courington, 1981; Kobasa, Maddi, & Kahn, 1982) of hardiness and health are probably the best current example of research of this type. However, until there is compelling evidence that specific life experiences or personality processes have broad spectrum effects on resistance to disease or psychological distress, or can be linked directly to a specific disease category, it is unlikely that they will or should be given much research attention in Indian and Native populations.

Specific Research Topics

We have chosen to limit our discussion of specific research topics to a select few identified in the original "Stress, Coping, and Health" chapter in the Hamburg et al. (1982), Health & Behavior volume, or which appeared to us to have the possibility of informing future research in Indian and Native populations.

The Importance of Perceived Control

This section will discuss the concept of perceived control as a psychological variable used frequently in past health behavior research which may have substantial promise for future studies with Indian and Native populations. We will consider recent theoretical and empirical advances which increase the potential usefulness and appropriateness of perceived control as a variable, as well as limitations on its research use with Indian and Native populations.

The "Stress, Coping, and Health" chapter emphasized the importance of perceived control to health behaviors. Unfortunately, there was a striking cultural bias in the type of perceived control considered most relevant for health behaviors. For example, it was strongly asserted that the tendency to deal actively with environmental conditions and threatening events was a fundamental aspect of human adaptability and this tendency extended to health-related events. Although the models of perceived control used to inform such assertions were relatively current at that time (e.g., Janis & Rodin, 1979; Rodin, 1980), there have been a number of advances in both theoretical and empirical research during the last 5 years which have expanded on original conceptualizations of the construct of perceived control. These advances are directly related to sociocultural influences on the relationship of perceived control to important health behaviors.
Theoretical advances. Perhaps the most important theoretical advance in recent years has occurred with regard to important distinctions between types of perceived control. Rothbaum, Weisz and Snyder (1982) have identified both primary control and secondary control as important to the understanding of a number of control-oriented behaviors and have expanded significantly on the definition of different forms of secondary control.

The original Health and Behavior volume focused almost exclusively on what has been termed primary control, or the ability to enhance one’s behavioral outcomes by influencing existing realities (e.g., stressful circumstances, physical symptoms, or health-related behaviors) (Table 3). Secondary control contrasts with primary control in the emphasis on enhancing behavioral outcomes by accommodating to existing realities and achieving goodness of fit with existing circumstances. Although there is limited empirical support, secondary control may be more representative of, and of greater consequence for, Indian and Native health behaviors. Rothbaum and colleagues (1982) suggest that broadening the conception of control and how it is manifested in everyday life leads to greater explanatory power for a variety of behaviors attributed to learned helplessness or perceived uncontrolability. Learned helplessness and perceived uncontrolability are in turn manifested in various "inward" behaviors such as passivity, withdrawal, and submissiveness. These behavioral manifestations are commonly attributed to, and are frequently used to explain the motives of, Indians and Natives in a variety of health behavior contexts.

Table 3
Primary and Secondary Control: An Overview

<table>
<thead>
<tr>
<th>Type of Control</th>
<th>General Strategy</th>
<th>Typical Targets for Causal Influence</th>
<th>Overall Intent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Influence existing realities</td>
<td>Other people, objects, environmental circumstances, status or standing relative to others, behavior problems</td>
<td>Enhance reward (or reduce punishment) by influencing realities to fit self</td>
</tr>
<tr>
<td>Secondary</td>
<td>Accomodate to existing realities</td>
<td>Self’s expectations, wishes, goals, perceptions, attitudes interpretations, attributions</td>
<td>Enhance reward (or reduce punishment) by influencing psychological impact of realities on self</td>
</tr>
</tbody>
</table>

Note. From "The Psychology of Control in America and Japan" by J.R. Weisz, F.M. Rothbaum, & T.C. Blackburn, 1984, American Psychologist, 39.

Secondary control via alternative paths to direct influence over events refers to attempts to align oneself with existing realities, leaving them unchanged but exerting control over the personal psychological impact of these realities. Table 4 briefly summarizes the forms of secondary control, with definitions and examples showing behavioral manifestations of the specific form of control.
Table 4

Four Forms of Secondary Control

<table>
<thead>
<tr>
<th>Form of Secondary Control</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictive</td>
<td>Attempts to accurately predict events or conditions so as to control their impact on self (e.g., to avoid uncertainty, anxiety, or future disappointment)</td>
<td>Trying to anticipate one’s exact status within a social hierarchy, the rules of etiquette that will be followed in a social event, or the sequence of steps by which a corporate decision will be made so as to minimize uncertainty and discomfort in those situations</td>
</tr>
<tr>
<td>Vicarious</td>
<td>Attempts to associate or closely align oneself with other individuals, groups, or institutions so as to participate psychologically in the control they exert</td>
<td>Identifying closely with and adapting one’s behavior to sustain alignment with one’s peer group, supervisor, employer, work group, or family so as to derive feelings of self-esteem and pride from their accomplishments and successes</td>
</tr>
<tr>
<td>Illusory</td>
<td>Attempts to associate or get into synchrony with chance so as to enhance comfort with and acceptance of one’s fate</td>
<td>Learning to accept streaks of good and bad luck, health and illness, or business success and failure as they come; to avoid fighting bad luck; and to be &quot;at peace with what fate has given me&quot;</td>
</tr>
<tr>
<td>Interpretive</td>
<td>Attempts to understand or construe existing realities so as to derive a sense of meaning or purpose from them and thereby enhance one’s satisfaction with them</td>
<td>Learning to see the advantages of one’s anxiety (e.g., it keeps one alert and makes one prepare work thoroughly), attaining transcendental awareness, and overcoming a desire to make realities better than they are</td>
</tr>
</tbody>
</table>

Note. From "The Psychology of Control in America and Japan" by J.R. Weisz, F.M. Rothbaum, & T.C. Blackburn, 1984, American Psychologist, 39.

Rothbaum et al. (1982) reviewed a wide range of empirical studies on perceived control which indicated that Western investigators typically view behaviors reflecting secondary control as indicative of relinquished control. Weisz, Rothbaum, and Blackburn (1984) subsequently summarized a number of conclusions, regarding this point as follows: (p. 956)

1) Outcomes attributed to low ability combined with behaving in a passive and withdrawn manner are often considered signs of helplessness; yet, this combination may often represent an attempt to inhibit unfulfillable expectations, thus preparing oneself for future events and thereby gaining "predictive" secondary control.

2) When outcomes are attributed to powerful others and submissive behavior is displayed, people are often thought to have abandoned the pursuit of perceived control; yet, this pattern may foster enhanced identification with the powerful others and thus promote "vicarious" secondary control.

3) Attributing outcomes to chance, luck, or fate combined with passivity in or withdrawal from certain competitive skill situations is frequently seen as evidence of relinquished control; yet, this combination may often reflect an attempt to be allied with forces of chance or fate so that one may feel a partnership with chance, and thus experience "illusory" control.
4) The forms of secondary control discussed in 1, 2, and 3 above may foster "interpretive" secondary control by individuals altering their perspective on realities of the world so as to derive meaning and acceptance through a sense of control and mastery. Finding reasons for unalterable events presumably serves to provide some degree of control over at least the personal psychological impact of those events.

Interpretive control may also be closely related to what has been termed a sense of coherence, or

...the global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one's internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected. (Antonovsky, 1980, p. 123)

Antonovsky posed a sense of coherence as a counterpoint to the sense of control (or perceived control) and argued that the crucial issue was not whether individuals had the power to determine outcomes or whether such power was lodged elsewhere. Rather, the important point was that the location of power was where it was legitimately supposed to be (e.g., within oneself, with the head of the family, patriarchs or matriarchs, leaders, formal authorities, history, or a deity). Antonovsky further argues that the element of legitimacy constitutes assurance that issues will ultimately be resolved by such authority in one's own interests. Thus, a strong sense of coherence is not at all endangered by not being in control of oneself.

Weisz and colleagues (1984) extended the theoretical analysis of primary and secondary control to culturally different populations which have historically been characterized by greater emphasis on secondary forms of control (e.g., Japanese). They suggest that the emphasis on and expectation for primary control which dominated the earlier theoretical formulations has largely ignored the cultural context involved in different approaches to perceived control. Weisz et al. (1984) used cross-cultural differences in child rearing, socialization, religion, philosophy, work, and therapeutic interventions to illustrate the costs and benefits of both primary and secondary approaches to perceived control. An optimal blend of primary and secondary control is suggested as a desirable goal for both individuals and cultures in general.

Peterson (1982) has also criticized the learned helplessness-uncontrollability implications of the primary external control orientation. She has identified some important implications of more recent formulations which incorporate social context in examining the relationship between perceived control and health behaviors. For example, she suggests rescaling life events in terms of uncontrollability as well as stressfulness as a means of increasing their interpretability with respect to negative health outcomes. Theoretical formulations which take sociocultural context into account will obviously be more
useful for studying the role of perceived control in the health behavior of Indians and Natives and should significantly improve future studies which incorporate psychological variables in their design.

Still other theoretical developments indicate that the multidimensional and sphere-specific nature of perceived control will need to be recognized when relating it to health behaviors. For example, Paulhus (1983) provided empirical evidence derived from confirmatory factor analysis for partitioning individual differences into components associated with three primary spheres of behavior: (a) personal efficacy—control over the nonsocial environment, (b) interpersonal control—control over people in dyads and groups, and (c) sociopolitical control—control over social and political events and institutions. Thus, rather than measures of generalized expectancies for internal or external control (e.g., Rotter's I-E Locus of Control Scale) the individual should be characterized by a control profile showing the pattern of expectancies that he or she brings into play in different behavioral spheres.

Empirical advances. The hypothesized relationship of perceived control to a variety of health behavior outcomes has been a prominent feature of the literature to date. Wallston and Wallston (1982) described the use of the "health locus of control" concept as both an independent and dependent variable that could be reliably measured, but, they were less confident about the construct validity of their measures. Nelson and Cohen (1983) used locus of control as moderator variable in the relationship between life stress and psychological disorder in a longitudinal study and found that negative life events were significantly related to psychological disorder at two different periods of measurement. Dispositional locus of control beliefs and control perceptions did not moderate the effects of life events at either measurement period.

Perceived control and desired control in different life domains has also been the subject of considerable study (Reid & Ziegler, 1981) and appears relevant to control orientations in the health behavior domain. However, the results of studies of desired control for different health behaviors have been less than conclusive. For example, Smith, Wallston, Wallston, Forsberg, and King (1984) had limited success using Burger and Cooper's (1979) Desire for Control Scale in discriminating among known groups with respect to types of preparation for childbirth, choice of place to die, and signing a living will. By contrast, Conway, Abbey, and French (1983) obtained measures from health clinic outpatients with respect to the amount of internal control, control by others, and chance control they perceived they had, as well as how much they desired to have in one of six life domains: work life, health, personal life, emotions, actions and behavior, and life as a whole. Both perceived and desired internal control were highest in the
self-oriented domain of action and behavior, and lowest in the health domain and the other-oriented domain of work life. Desired control by others was higher in the health domain than in all other domains.

One of the potentially more useful aspects of the perceived control variable that is of direct concern for Indian and Native populations is the interactive moderator function of locus of control and social support (Lefcourt, Martin, & Saleh, 1984). Sandler and Lakey (1982) first raised the question whether locus of control influenced how persons made use of potential social supports and found interactions between negative life events and social supports when they predicted anxiety and depression among internally oriented but not for externally oriented persons. Both anxiety and depression following negative life events were moderated for internals by the presence of social support. The same was not true for externals. Results of a replication and expansion study (Lefcourt et al., 1984) corroborated that persons with an internal locus of control derive greater benefits from social support than do those who have a more external orientation. In addition, Lefcourt et al. found that the moderating effect of social supports largely occurred among those who were less generally affiliative and more highly autonomous, thus supporting the potentially greater benefits of social supports for those who are more instrumental and sparing in their approach to social interaction. Such findings obviously have significant implications for studies which intervene to alter the health behaviors of culturally different persons by attempting to influence their typical patterns and profiles of control orientation.

Research implications for Indian and Native populations. In light of the considerable attention to perceived control as an independent, dependent, or moderator variable in health and behavior relationships, it would seem that research among Indian and Native populations would benefit from the incorporation of perceived control in future research designs. Unfortunately, a number of prior steps would be required before perceived control could be interpreted unambiguously. Hui (1982) reviewed over 70 cross-cultural studies of locus of control and found that cross-cultural and cross-ethnic similarities and differences were generally inconsistent and inconclusive. Issues of cross-cultural conceptual equivalence and functional equivalence, dimensionality, appropriateness of measuring instruments, and modes of cross-cultural comparison all remain outstanding. Moreover, there are few studies of perceived control specific to Indian and Native populations that could be used to inform the use of the construct in health behavior research.

Trimble and Richardson (1982) appear to have conducted the only research which used a large enough sample to support conclusions about the factor structure of locus of control among Indians and Natives. These results indicate a separation of personal control—the control individuals have over their own
lives—from ideological control—the societal control that people in general possess. Separate factors were also found for trust, personal control, race ideology, ideological control, and a residual fate ideology. Although locus of control for Indians was multidimensional in nature, all the dimensions still were rated in the external direction. These results clearly suggest the potential usefulness of the perceived control construct for health behavior research, but there have been few health behavior studies with Indians and Natives which have used it as any kind of variable, let alone as a sophisticated interactive moderator variable with social support as in the studies described above (e.g., Lefcourt et al., 1984).

A single recent study of Indian and White differences in coping strategies used to respond to the stress of caretaking for elderly relatives (Strong, 1984) suggests that both theoretical and empirical advances in the study of perceived control have relevance for Indian and Native populations. Coping strategy scores in this study were derived from Pearlin and Schooler’s (1978) three major categories of (a) changing the situation, (b) controlling its meaning, and (c) managing the resulting stress. Although the samples were quite small (Indian N=10; White N=11), there was a major difference between Indian and White groups in the use of the control dimension. Whereas 8 of the White caretakers identified control as relevant to their situation, only 2 of the Indian caretakers referred to control. Moreover, the 2 Indian caretakers who referred to their ability to control or influence the situation did not believe they had control of the situation, nor did they expect to gain control in the future. Strong also analyzed the culture-interpretation-coping interaction of respondents with respect to specific caretaking events by comparing passive forbearance scores, which she considered to be a subtype of the stress management coping strategy. Respondents who did not use the control dimension or who accepted not having control had significantly higher passive forbearance scores than those who reported having or seeking control. Differences in perceptions of actual and expected control, as well as passive forbearance as a coping strategy, were interpreted in light of norms of "noninterference" among Indian and Native populations.

One critical concern raised by such research is the very limited empirical data on similarities and differences among Indian and Native groups concerning belief in personal control, coping strategies in response to stress, and values about the desirability of control over health events if control were possible. Theoretical advances in distinctions between primary and secondary control, as well as forms of the latter (Rothbaum et al., 1982), and methodological and empirical advances in the use of perceived control as an interactive moderator variable (Lefcourt et al., 1984) should clearly be considered in future studies with Indian and Native populations.
The Stress-Mediating Role of Social Supports

Stressors do not affect all exposed persons in the same way and have not been found to be reliable predictors of morbidity and mortality. This has led to a search for social and psychological factors that buffer or mediate the physiological and psychological consequences of stress. Social support is recognized as a major resource in ameliorating the effects of stress on physical and mental health.

Social support has been defined in various ways, reflecting the multidimensionality of the concept and the lack of consensus about its nature, meaning, and measurement. Cobb (1976) defines social support as information that leads a person to believe he or she is cared for and loved, esteemed and valued, and belongs to a network of mutual obligation. This definition is limited to emotional support and excludes instrumental or tangible aid from others. According to House, Kahn, McLeod, and Williams (1985), social support involves the exchange between people of (a) emotional concern (empathy, caring, concern), (b) instrumental aid (giving money, assistance), (c) information (advice, suggestions, directions), and/or (d) appraisal (feedback or social comparison relevant to a person's self-evaluation).

Others have divided support into emotional (feeling that one is loved and cared about), tangible (direct aid or services), and informational (information, advice, and feedback) (Schaefer, Coyne, & Lazarus, 1981), while Kaplan, Cassel and Gore (1977) divided the provision of social support into "socioemotional" and "instrumental" (which includes both tangible and informational aid). Antonovsky (1980) defines social supports as one category of "General Resistance Resources."

A particular conceptual problem has arisen from the failure to recognize the multidimensionality of the concept and the often interchangeable use of the terms "social support" and "social networks." Perceived amount of support, types of support, and sources of support are all important dimensions to be measured. Social support is distinguished from social network in that the latter defines the structure, frequency, or quantity of social contacts, while the former defines the self-perception of the quality of contacts. Social networks obviously provide the basis for social support, but networks can be defined objectively while support must be defined subjectively. Thoits (1982) has recommended that the subset of persons in a person's total network who are relied upon for socioemotional and/or instrumental aid be defined as the "social support system." Within this system one can measure structural features using the classic network dimensions such as size, density, homogeneity, reachability, source of ties, and frequency of interaction. One can also measure the functional properties of the system, such as the perceived amount and adequacy of aid received from various support system members.
Epidemiological evidence. Community studies which showed that socio-economic instability and disintegration were associated with increased mortality and morbidity from hypertension, strokes and myocardial infarctions, and higher rates of mental disorder, were the forerunners of investigations of social support and health (Bruhn et al., 1966; James & Kleinbaum, 1976; Leighton, 1959).

These "ecological" studies have been followed by numerous investigations of the relationship of social support to health and well-being on the individual level. Researchers from a variety of disciplines, using many different measures of social support, have produced ample evidence of its association with reduced physical and mental morbidity (Brown, Brolchain, & Harris, 1975; Cobb, 1974; Gore, 1978), reduced mortality (Berkman, 1980; Berkman & Syme 1979; Blazer 1982; Kasl, 1983), and enhanced rehabilitation and recovery (DiMatteo & Hays, 1981). The effect of social support seems to be nonspecific and reduces vulnerability to a broad range of chronic diseases (Broadhead et al., 1983).

Mechanisms of effect. If the relationship between measures of the social support system and health outcomes is not confounded by a third variable, the potential explanations of how social support exerts its effect on health include: (a) alteration of the occurrence or exposure to stressors, (b) alteration of the perception or appraisal of stressors so that they have a less deleterious impact, (c) facilitation of coping with stressors once they occur, perhaps through the resources or feelings of control that group membership may provide, (d) influence upon the utilization of health care services and practice of health-enhancing behaviors, and/or (e) direct changes in the physiological defenses of the individual (Berkman & Breslow, 1983; Blazer, 1982; Cobb, 1976). Broadhead et al. (1983) have reviewed evidence that supports all of these mechanisms.

Figure 3 illustrates one way to conceptualize the process or mechanism of social support. It incorporates such dimensions of support as perceived availability of support from a variety of sources (culture, social institutions, groups, individuals); coping style; perceived adequacy of support; effects on physical, social, and psychological functioning; and a feedback loop indicating that changes in functioning can influence perceived availability of support. This appears to be one of the more appropriate models of the social support process for use in research with Indian and Native populations.

Theoretical and methodological issues and needs. Conceptual and methodological issues and problems related to research on social support have been discussed by many authors and are reviewed and summarized briefly here.

Operational definitions of support vary greatly across studies and most investigators have not attempted to formulate a precise conceptual definition of social support. As a result, development of valid and reliable measures has been slow, and many measures of support are post hoc collections of questions formulated from existing data sets. Thoits (1982) has recommended Kaplan et
Figure 3. Flow chart of the mechanism of social support.

al.'s (1977) definition of social support as "socioemotional and instrumental aid," and defines the social support system as "that subset of persons in the total social network who provide this aid." One can thus operationalize and examine the structural properties of the social support system, as well as the functional properties of the system, including perceived amount and benefit of aid received from system members.

Few measures have dealt with the multidimensionality of the construct. Studies of the role of social support in physical and mental health have tended to measure subjective or objective support, but rarely have multiple dimensions of support been assessed and their separate relations to health outcomes examined. Even when separate dimensions are measured, scores are summed across categories and are difficult to interpret.

Likewise, there has been little attention until recently to validity and reliability of social support measures or to relations among components of social networks and support. Investigators who have examined some of these issues have found that the social support concept is heterogeneous and, while there are low correlations between major components, they suggest components of social support indexes should be examined before using a summary score (Blazer, 1982; Donald & Ware, 1984). Investigators have also found there are not simple additive, linear relations between perceived support and numbers of social contacts, or other sociodemographic variables (Donald & Ware, 1984; Stokes & Wilson, 1984), nor are objective and subjective measures of support related to physical and mental well-being in the same ways (Andrews, Tennant, Hewson, & Vaillant, 1978; Blazer, 1982; Donald & Ware, 1984; Schaefer et al., 1981).

An especially serious issue is that measures of support tend to be confounded with measures of both physical and mental well-being. There are as yet no valid measures of qualitative social support independent of mental health (Donald & Ware, 1984). On the other hand, objective definitions of social support that simply count the frequency of social activities and contacts without regard to whether they are perceived as beneficial or adequate also may be misleading (Donald & Ware, 1984). Furthermore, objective measures of frequency of contact may be confounded with physical health status and functional impairment (Blazer, 1982). There may also be social selection processes wherein individuals with psychological or physical impairment are unable to form and maintain social support systems (Thoits, 1982).

Measures of social support also overlap with measures of stress. Many important events in Life Events Scales involve losses or gains of potentially supportive relationships. Life events are conceptually and operationally equivalent to social support change but also may produce further changes in the social support system (Thoits, 1982). Life events may result in loss of supportive interaction and/or stimulate aid. Current level of support is likely to
be a result of prior life changes. Pre-existing psychological disturbance may determine both an individual’s social support levels and experience of life events. Thoits (1982) recommends that investigators measure level of support before and after stressful life events and then derive a measure of stable support level, independent of changes in support over time.

The findings that social supports buffer stress and are unrelated to well-being in the absence of stressors may be attributable to the confounding of life events with support. Measures used by investigators who find support for the buffering hypothesis (e.g., Nuckolls, Cassel, & Kaplan, 1972) are better described as measures of life difficulties than measures of social support, and may account for the buffering effect found in these studies (Thoits, 1982). Furthermore, the proposition of the buffering hypothesis is challenged by other research, which finds direct effects of support on well-being (Dean & Lin, 1977; Donald & Ware, 1984), and by theory. To the extent that a social support system contributes to self-esteem, social identity, and social integration, it would be expected to have a salutary effect upon well-being independent of life events (Thoits, 1982).

Eckenrode and Gore (1981) argue for the need for contextual studies which describe social sources of stress as well as support. Contextual studies should also include attention to how support is mobilized and used in stressful situations (Ell, 1984). In addition, many stressors affect all members of a network. There is a need to examine stress at the network level in addition to the individual level. These kind of data are essential for preventive efforts at the community and individual levels.

One final consideration that has been overlooked by most researchers is a longitudinal or life cycle approach to studying social support. Of particular concern are the ways in which changes in social roles and life events through the life cycle are related to the perception of the need for social support, the type needed, and its availability and accessibility (Broadhead et al., 1983; Bruhn & Phillips, 1984; Pilisuk & Froland, 1978). Figure 4 illustrates a possible pattern of the changing nature of social support throughout the life cycle.
Implications for research with Indian and Native populations. The social support system seems an especially pertinent subject of research among Indians and Natives in light of the morbidity and mortality which are a result of social and environmental pathologies, and the often-documented changes in family structure (from extended to nuclear) and function (Kunitz & Tsianco, 1981). Among the Navajo, chronic drinkers are often socially ostracized (Kunitz, 1983), and mothers of fetal alcohol syndrome children were observed to lead disruptive and chaotic lives and were frequently isolated from mainstream social activities (May, Hymbaugh, Aase, & Samet, 1983). The obvious question remains of whether drinking is a cause or effect of social isolation.

We know of only one study of social support systems in an Indian population. Manson (1984) compared the networks of elderly (age 55 and above) Native Americans in three settings: two rural reservation communities and an urban area (Portland, Oregon). There were no significant differences in the structural features of the networks of elderly Indians residing on the two reservations. However, the networks of the urban elderly Indians differed in several important respects from those of either of the reservation samples. The average number of important persons reported by the urban sample was half that of either reservation (4.5 vs. 9.7 and 9.8). While the networks at all the sites consisted predominantly of family members, this was more pronounced at the reservation sites (89%) than the urban site (75%). Furthermore, 10% of the urban Indian elderly included social service/health care providers in their networks while
virtually none of these providers were included in the networks of reservation dwellers. In addition to being larger, the networks of reservation elderly were more dense and more reachable than those of the urban elderly. This difference may have reflected the greater geographic dispersion of the urban elderly Indians’ family members. Finally, reservation elderly mostly interacted face-to-face with network members while urban elderly relied more on telephone conversations.

Neither reservation nor urban elderly Indians thought that support from network members would be of much help in solving problems related to physical illness. Nor was either group likely to actively seek support in coping with problem situations. Rather, they expected that significant others would know of their need and would offer assistance without being asked.

The finding that the support systems of the urban elderly were less dense and more often included formal sources of support is intriguing in light of the findings of others that a dense, homogenous network may be less adaptive in times of psychosocial transition than a less dense, heterogeneous network (Granovetter, 1973; Hirsh, 1980). Other interesting issues remain, including whether reticence about soliciting assistance is characteristic of other elderly Indians and Natives, and how assistance seeking varies by age or other sociodemographic characteristics. Definitions of emotional support and what is perceived as supportive or countersupportive are also important research issues among Indian and Native populations.

Coping Decisions/Behaviors and Health Belief/Behavior Models

One way in which stress and coping may be related to health outcomes is through the utilization of health care services and the practice of health-facilitating behaviors. This leads us to the topic of decision making surrounding the utilization of services and adherence to treatment, and patterns of coping with the stress of illness.

In recent years, a great deal of effort has been devoted to developing conceptual frameworks and empirical studies of psychosocial factors which explain and predict health-related decisions. These studies have focused on three categories of health-related behaviors: (a) illness behavior (seeking diagnosis and treatment for symptoms), (b) sick-role behavior (receive and adhere to treatment designed to restore health or halt disease progression), and (c) preventive health behavior (prevent disease or detect at asymptomatic or early stages) (Becker & Maiman, 1983; Kasl & Cobb, 1966). Selected models which attempt to explain one or more of these classes of behavior will be reviewed briefly, along with the available literature on health-related behavior among Indians, after which suggestions for research applications will be made.
Models of Treatment Seeking and Health Care Utilization

Suchman (1965) sought to explain variations in "the seeking, finding, and carrying out of medical care" in the individual's social group affiliation and health orientation. Social structure was defined by an index measuring parochialism versus cosmopolitanism while health orientation was seen as a continuum ranging from popular to scientific. Suchman hypothesized that parochial groups characterized by traditional family orientation, ethnic exclusivity, and friendship solidarity are more likely to hold popular or folk health orientations. By contrast, cosmopolitan groups who interact more with nonkin and are less tightly knit, are more likely to hold scientific health orientations and adhere more closely to the norms of the medical profession. Attempts to replicate this work among Mormons in Utah (Geertsen, Klauber, Rindflesh, Kane, & Gray, 1975) and Hispanics in Texas (Farge, 1978) have produced inconsistent results, perhaps because health orientations reflect specific subcultural beliefs and values, independent of social structure (Becker & Maiman, 1983).

Figure 5. Framework for viewing health services utilization.

The most widely used model for predicting utilization of services is that of Andersen, who proposed a framework for examining societal and individual determinants of utilization (Andersen & Newman, 1973). Figure 5 shows the relations of the major determinants. In any given societal and health services setting, use is dependent upon the individual’s (a) predisposition to use services, (b) ability to secure services, and (c) perceived need for services. Predisposing variables include demographic, social, cultural and economic characteristics, as well as beliefs, attitudes, and knowledge about medical care, physicians, and disease. Enabling conditions include income, insurance, and availability and accessibility of health services, while need is measured by perceptions and evaluation of symptoms. Empirical studies based on national surveys have found that need variables are the most powerful predictors of physician use (Becker & Maiman, 1983).

Young’s (1980) model of choice-of-treatment decision making consists of four components: (a) gravity—the seriousness of the illness as perceived by the individual’s reference group; (b) knowledge of a home remedy in the lay referral system for a particular type of illness; (c) faith—belief in the efficacy of different treatment options for the particular condition; and (d) costs and accessibility of health services. The model successfully predicted 91% of 489 treatment choices documented by case histories in a rural Mexican community. Gravity of the illness was the most important factor in treatment choices. For very serious illnesses, the practitioner in whom the family had the most faith was chosen, with less consideration to cost. For less serious illnesses, the family relied upon home remedies.

Fabrega’s (1974) model of medical decision making provides an abstract delineation of the sequence of decisions people make during illness. These stages include illness recognition and labeling, illness "disvalues" (pain, disability, death), consideration of treatment alternatives and treatment benefits and costs, determination of the net utility of each alternative (treatment costs subtracted from treatment benefits), selection of a treatment plan, and re-evaluation of the illness in light of the treatment plan and remaining illness manifestations. In terms of content, Young’s model is similar to that developed by Fabrega. However, Young does not make the assumption, as does Fabrega, that illness episodes are evaluated using "economistic or utility considerations" regarding the optimal treatment that might eliminate the illness.

Models of Adherence to Medical Treatment and Preventive Health Behavior

The Health Belief Model (HBM) has undergone the most empirical testing and has most consistently predicted preventive health behavior and adherence to medical treatment (Becker et al., 1977; Kasl & Cobb, 1966; Maiman & Becker, 1983; Rosenstock, 1974). The model contains four basic elements in the
prediction of undertaking a recommended health behavior: (a) subjective beliefs about personal susceptibility to the illness and the severity or seriousness of contracting it; (b) perceived benefits of the recommended health behavior vs. perceived costs or barriers; (c) internal and/or external cues to action (symptoms, media campaigns) which trigger the health behavior; and (d) social, demographic, structural, and psychological factors whose effect is presumed to be mediated by the individual’s perceptions and motivations rather than to be direct. The basic components of the Health Belief Model are illustrated in Figure 6.

Figure 6. The Health Belief Model.


A major criticism of the HBM is that it does not explain the tendency of people to delay obtaining medical care in the face of symptoms they know to be serious and life threatening (Janis, 1984). The conflict theory model formulated by Janis & Mann (1977) describes five basic patterns of coping with realistic threats, and takes account of stresses of making major decisions and the ways people deal
with those stresses. It postulates that rational choice models such as the HBM operate only when the coping pattern is vigilance; that is, when there is a careful search for relevant information and deliberate appraisal of options before making a choice (Janis, 1984). The vigilance coping pattern occurs only when all of three conditions are met: (a) awareness of serious risks for whichever alternative is chosen (creation of conflict), (b) hope of finding a better alternative, and (c) belief that there is adequate time to search and deliberate before a decision must be made. The other four coping patterns (unconflicted adherence, unconflicted change, defensive avoidance, and hypervigilance) are characterized as maladaptive behaviors in a situation of serious symptoms or where medical treatment is essential.

Both the HBM and conflict theory model are individual-centered models of decision making. Neither of these models postulate any direct effect of factors in the sociocultural environment, nor has there been any cross-cultural application. Furthermore, they lack variables that pertain to the interactions between and expectations of health caregivers and clients (Sackett & Haynes, 1976; Stone, 1979). Because of these characteristics, the HBM and conflict theory model, as they stand, probably have limited utility for understanding adherence and preventive behaviors in Indian and Native communities. The models reviewed next address some of these deficiencies.

![Figure 7. The health-seeking process.](image)

Note. From "The Health Seeking Process: An Approach to the Natural History of Illness" by N.J. Chrisman, 1977, *Culture, Medicine, and Psychiatry, 1*. 
Langlie (1977) proposed a model of preventive health behavior that integrates the social group structure of Suchman's model and the sociopsychological variables of the HBM. Health belief variables included perceived vulnerability, benefits, costs and barriers, saliency of health, perceived control over health matters, and attitudes toward health care providers. Social network variables included family and neighborhood socioeconomic status, kin and nonkin interaction, conjugal structure, and religious affiliation. She found that both health beliefs and social structure explained preventive health behaviors, and the two together explained even more of the variance in health behavior.

Chrisman's model of the Health Seeking Process (Chrisman, 1977; Chrisman & Kleinman, 1983) focuses on the ways lay and professional health care systems interact to influence the behavior of individuals. It draws on concepts from medical anthropology (Fabrega, 1974) and medical sociology (Kasl & Cobb, 1966; Suchman, 1965) and is proposed as a way to describe the natural history of illness in any subculture. The model in Figure 7 shows the five steps in the health-seeking process which may be taken by an individual who perceives a need for help.

Symptom definition involves the perception and evaluation of symptoms by an individual in terms of their danger and disability. Evaluation of danger is more nearly a cultural phenomenon relating to meaning while disability is social to the extent that it interferes with social roles and obligations. Role behavior shift involves the adoption of the sick role and is the point at which other people become involved in the illness episode. Lay consultation and referral relates to the "patterns of choice among potential consultants and the content of consultants' responses to the sick individual" (Chrisman, 1977, p. 358). This is influenced by health beliefs and practices, and the social structure of the lay referral system. In many cases it may be the family or clan, and not the individual, that makes decisions regarding care. Treatment actions refer to the behaviors, whether traditional, popular, or professional, which the individual undertakes in an attempt to cure or ameliorate the problem. Adherence is the extent to which the sick person acts upon treatment advice. This is dependent upon ongoing monitoring and evaluation of changes in health status, the congruence of the treatment with the patient's sociocultural construction of the problem, and evaluation of the care givers. These health-seeking elements do not necessarily follow a fixed sequence, and may recur as the episode is re-evaluated.

Research Implications for Indian and Native Populations

There are very few systematic, model-based studies of health care utilization among Indian and Native populations. Guilmet (1984) studied health care practices and health care seeking processes among Puyallup Indians in
Washington by examining the "hierarchy of resort" to lay and professional sources of treatment in families. Sickness episodes among children and elderly family members were more likely to first receive lay treatment than were sickness episodes of other adults, although the majority of all sickness episodes first received lay treatment. As other investigators have found, perceived severity of sickness by the individual (or family members in the case of children) was the most important determinant of health care seeking behavior. Factors pertaining to access, availability, and ability to pay were less important due to the availability of free medical care in the Puyallup community.

In a study of the utilization of contraception among Navajo women, Kunitz and Tsianco (1981) hypothesized that women who were more dependent upon kin would be less likely to use contraception. Their results supported this hypothesis but only among older, more poorly educated women of high parity. However, in a complementary study, rates of tubal ligations and abortions were highest in areas of the reservation where family organization tended to be nuclear rather than extended (Temkin-Greener, Kunitz, Broudy, & Haffner, 1981). These data support Suchman’s hypothesis that kin group structure and interaction influence health care utilization.

Other information on health care utilization in Indian and Native populations tends to be anecdotal, based on personal experience and observation, or based exclusively on hospital and clinic records. Researchers in other populations have observed that there does not have to be understanding or even acceptance of modern medicine for people to use it (Erasmus, 1952; Gould, 1965; Press, 1978). Adair (1963) described the Navajo patient as a "pragmatist and an experimentalist—if one thing doesn’t work he will try another." Navajo have been reported to eagerly accept treatments in Western medical settings that involve rapid relief of symptoms and repair of lacerations and broken bones, but may resist surgery and have trouble taking medications as prescribed for chronic conditions. Among the Navajo, modern medicine is viewed as a means to alleviate symptoms rather than to cure or prevent disease. Traditional medicine, in contrast, is thought to cure the illness or treat the cause itself (Kunitz, 1983). Similar observations have been made about other native peoples (Erasmus, 1952; Sturtevant, 1955).

Medical care decision making is more complicated than these generalizations would imply. Among the Navajo, distance from a medical facility and availability of transportation may be among the most important factors explaining utilization (Davis & Kunitz, 1978). In addition, Kunitz (1983) cites the role of the lay referral system and the centrality of matrilineally related women in decision-making networks, especially where choices involve costly curing ceremonies.
Kupferer (1966) examined the relationship of acculturation to health-seeking behavior among the Eastern Cherokee of North Carolina and found that the least acculturated "conservative" Indians used both Indian and White (Public Health Service) medical practitioners. In the view of most "conservative" Indians, the two types of medical assistance were not antithetical, but were complementary. The more acculturated Cherokees were found to be more committed to modern medicine and used either Public Health or private doctors, depending in large part upon ability to pay.

As is the case in other populations, accessibility is a major factor influencing health service utilization among Indians and Natives. There is ample evidence, though, that Western medicine is well accepted in Indian and Native communities.

Sociocultural and psychological factors probably have less to do with clinic visits than with adherence to treatment and practice of preventive behaviors. However, model-based studies of adherence to treatment are also lacking. Kupferer (1966) observed that dissatisfaction with the kind of care received from hospital staff was one of the factors that led to use of traditional healers among conservative Cherokees. Among Cherokees who had diabetes, those who were more acculturated tended to follow treatment recommendations more closely, including diet and weight loss. Less acculturated diabetics were reported to be more conscientious about insulin injections than dietary regulation.

Among Florida Seminoles, nonadherence to treatment for chronic conditions such as diabetes and hypertension was reported to be common by IHS personnel. Patients were more likely to follow treatment recommendations when they experienced symptoms than when they did not (Joos, 1984). Problems with proper medication use are also pervasive among the Navajo (Kunitz, 1983). West (1978), however, reported a "fairly high success rate in achieving weight loss among Oklahoma Indian diabetics who really understand the risk of vascular and neurologic disease that attends diabetes and the dramatically favorable effects of weight loss." He does not explain how this understanding was imparted, but he does recommend that the advantages of weight loss and dangers of not doing so should be systematically transmitted to diabetics, their spouses, and other members of the household.

Numerous researchers have reported that perception and reporting of symptoms vary by social and cultural characteristics (Angel & Cleary, 1984; Fabrega, 1977; Guilmet, 1984; Kunitz, 1983; Mechanic, 1983). The absence of distressing symptoms is a major determinant in failure to adhere to recommended treatment (Becker et al., 1977; Janis, 1984). This influence on behavior has been called "acute disease thinking" and may explain the difficulty patients have in following treatment recommendations for chronic conditions in the absence of symptoms (Leventhal, Zimmerman, & Gutmann, 1984).
Most of the models have stimulated very little research on ways to modify the predictors of health-related behaviors (Becker & Janz, 1984; Leventhal et al., 1984). What is now needed is an understanding of the strategies and interventions that can facilitate changes in behavior. Behavioral models such as HBM suggest an approach of student/patient learning by instruction, imitation, and rehearsal, to learn recommended behaviors. This approach, however, has not been able to produce long-term changes in behavior.

The self-regulation model (Leventhal et al., 1984) is an alternative approach to understanding adherence to treatment that may be especially relevant to Indian and Native populations. It is based on a control theory perspective, which views behavior as drawn toward goals rather than pushed by stimuli. It emphasizes that people generate their own representations of health threats, and plan and act in accordance with these representations. The basic components of the self-regulation or self-control mechanism are: (a) the representation of the health problem which is developed using information from the social network, professionals, and media, as well as symptoms, and (b) planning and action (coping) which depends upon the individual’s sense of effectance, repertoire of specific coping responses, and appraisal of outcomes. The self-regulation perspective suggests the need for practitioners and patients to share information about their views of a health problem or threat and strategies for coping, and develop a collaborative plan for health maintenance. The advice of traditional practitioners may be ignored as often as that of Western practitioners (Kunitz, 1983; Sturtevant, 1955), underscoring the importance of the individual’s own conceptions and decision making surrounding treatment.

This approach is reminiscent of that of Kleinman who proposed that people develop explanatory models (EM) during particular sickness episodes by which they assign meaning to the experience. An EM is a composite of beliefs about etiology, time and mode of onset of symptoms, pathophysiology, course of sickness, and treatment. Congruence between EMs of patient and caregiver and the amount of change that occurs in these EMs through clinical interaction may not predict utilization of services, but it may reflect the quality of patient-clinician interaction and predict patient satisfaction and compliance (Phillips, 1985). Kleinman (1980) and proponents of the HBM (Rosenstock, 1974) have suggested that caregivers should elicit patients’ perceptions about an illness or health problem and work with them (or "negotiate" in Kleinman’s term) to develop a treatment strategy. Quality of patient-client communication may be a major factor affecting adherence (Sackett & Haynes, 1976).

Most behavioral change interventions focus on the individual. However, these models suggest that the decision-making group should be identified and involved in interventions. Research on either individual or group-based decision making
as a mediator of health behaviors is clearly indicated as a first step in understanding how the stress of symptom onset and subsequent illness is coped with among Indian and Native populations.

Priority Research Issues for Indian and Native Populations

A basic conclusion from the above discussion is that stress, coping, and health relationships have been virtually ignored among Indian and Native populations. This clearly suggests that a research frontier lies ahead for health and behavior studies. In this section we propose a beginning set of basic research issues that may serve to inform future studies regarding stress, coping, and health relationships among Indian and Native populations.

1. Specific studies are needed of the types of life events which are indicative of heightened vulnerability and at-riskness for significant adverse health changes among Indian and Native populations.

2. Future studies should attend to those aspects of the environmental setting and the psychological characteristics of the person which determine the distribution and magnitude of change required by different life events among Indian and Native populations.

3. Social epidemiology studies are needed of the tribal differences important in accounting for significant variations in the exposure and reaction to different types of life events.

4. The changes which occur in the nature and type of life events and the reactions to such events over the life course of Indians and Natives, as well as the implications of such changes for specific interventions, need to be examined much more closely.

5. A conceptual framework is needed for classifying important psychosocial mediators of stress in Indian and Native populations which goes beyond identification of environmental resources, personal resources, and coping processes, which act as antecedents of stressful life events. A nomenclature of stressful life events and a taxonomy of coping responses which are more appropriate for Indian and Native populations would be a useful first step in exploratory studies.

6. The mechanisms through which psychosocial factors influence the effects of stressors on physical and mental disorders among Indians and Natives needs to be explored in much greater depth, particularly with respect to better understanding of those mediating factors which help to identify points of increased effectiveness for intervention.

7. The development of culturally sensitive, reliable, and valid instruments for identifying and measuring the psychosocial components of stress responses among Indian and Native populations should receive high priority.
8. Basic studies are needed regarding the role of stress in the predisposition, precipitation, and perpetuation of a wide range of major physical and mental disorders that appear to be increasing as sources of morbidity and mortality among Indian and Native populations.

9. Studies need to be designed to examine the multiple disease consequences of psychosocial factors which mediate the effect of stressful life events rather than the disease-specific focus which currently characterizes Indian and Native health research.

10. Stress research in Indian and Native populations will benefit from clear distinctions among stressors, reactions, and mediators, that provide greater clarity with regard to the essential components of the stress and health outcome process.

11. It will be important to design studies which identify the interactive effects of the various types of internal and external mediators that are employed both individually and collectively by Indians and Natives, as well as the specific health consequences these mediators produce.

12. The social and economic contexts of various tribal groups, as well as the roles and status occupied by individuals in different social networks or types of social organization need to be incorporated in studying life events and their consequences through the life course of Indian and Native peoples.

13. Studies of work-related stress and organizational role conflicts, as well as the process of adaptation to wage-work or the lack of employment opportunities, are critically needed among Indian and Native populations.

14. Longitudinal studies of the coping processes involved in managing stressful life transitions among identifiable subgroups of at-risk Indians and Natives, such as those in higher education settings or in urban work environments, would be very useful in the design of preventive and promotive health interventions.

15. In the face of energy development and technological innovations which may impact tribal groups, studies are needed of both the positive and negative health consequences of uprooting, relocation, and forced or chosen migration.

16. The role of sociocultural factors needs to be examined insofar as these factors may act as constraints on attempts to intervene in mitigating the predicted stressfulness of unwanted changes in traditional lifestyles and cultural institutions.

17. Efforts to identify health changes associated with exposure to stressors should also attempt to measure neutral or positive outcomes and the internal and external mediators that contribute to these consequences, particularly when negative consequences have been predicted from exposure to presumed stressors.
18. Methodological studies will be required to develop culturally appropriate measures of the structure of social support systems, perceptions of support, and the mobilization and mechanisms of support operating during stressful health-related events among Indian and Native populations.

19. Future studies will benefit by incorporating emerging theoretical frameworks and methodological advances that appear to be more relevant and appropriate for Indian and Native populations.

20. An interdisciplinary team approach seems clearly indicated in designing studies to define stressors, clarify internal and external mediators, and to examine the relationship of these factors to health outcomes in Indian and Native communities.

Department of Psychiatry
Oregon Health Sciences University
3181 Southwest Sam Jackson Park Road
Portland, Oregon 97201

References


Discussion

Dr. Schulz: This is an important paper for several reasons. One is that it adopts a comprehensive stress-coping model and takes advantage of the extensive literature that exists and, as Norm pointed out, has not been integrated to date. This literature has been developed in laboratories and in the field on stress/coping/health relationships. I think Norm and his co-author do an excellent job of bringing those two bodies of knowledge together.

The other important thing about the paper is the sensitivity to subtle conceptual distinctions. The stress/coping literature is large enough that it deserves and demands careful examination to get out of it what it has to offer, and I think Norm and Sandy do that well.

An area that is hinted at, although not completely developed, which I will say something about, concerns methodological issues; how one would go about addressing some of the many questions raised at the end of the paper.

Probably the fundamental question within all of this research today concerns the nature of causal relationships among variables. This requires close attention in the years ahead.

Let me quickly start with the notion that there are objective conditions conducive to stress, which lead to perceived stress, and the assumption is that there is a direct causal relationship between these two entities.

A large number of conditioning variables moderate the relationship between perceived stress and some form of temporary coping response. All of this leads to long-term coping effects, and those are the health problems we usually identify as the ultimate outcomes of a stress-coping relationship. With this conceptual system, a variety of variables have received more or less attention in the research on stress and coping. One of the important questions in the context of a meeting like this is, which variables are amenable or have something to do with culture and which don’t.

Again, looking at the complete paper, one of its important contributions is distinctions between levels of analysis. Obviously, if one is interested in subtle biological mediators of stress-related events, one might raise questions about the importance of culture within that context. However, if one is broadly speaking about addressing a model like this, you quickly find that culture appears everywhere. It shows up in conditioning variables, such as social support or personality attributes. It shows up in the perception of stress. It affects, obviously, the environmental conditions that individuals are exposed to. This is a function of the culture in which one is embedded.

The paper discusses in some detail issues of perceived control, and makes the important distinction between primary and secondary control. Primary control is usually thought of as the ability to manipulate some aspect of the environment in order to attain outcomes important to you. An example of secondary control is
vesting your control in some third party, for example, a religious figure, and
deriving benefits from the belief that the third party or second party is going to
take care of things for you. It explains the phenomenon of an individual who, in
fact, has no real control over his or her world, but in fact experiences relatively
little stress when confronted with a variety of very problematic situations. That
kind of individual may, in fact, not exhibit any detrimental or negative effects
under circumstances that are objectively very stressful.

Well, that’s an interesting hypothesis, and also relevant to the cross-cultural
literature. But there are also some problems that I’d like to highlight. One is the
danger of reaching the conclusion that everybody has all the control they want
all the time. It really becomes a useless concept if you begin inventing
secondary and tertiary kinds of control. You could, I think, come up with a
situation where no matter who the individual is and what the context is, it’s
possible to come to the conclusion that the person has all the control that they
want or need and, in fact, shouldn’t experience any negative effects as a result.

The other aspect of secondary control concerns the demonstrated causal
efficacy of secondary control. There are literally scores of studies, many of them
laboratory studies, which demonstrate in a convincing fashion that individuals
who have control over particular negative outcomes in their lives, or feel that
they have control, will not show the negative stress effects that individuals show
who do not have that kind of control. I think that’s a fundamental finding, and it
has been replicated many times with many kinds of stressors in a variety of
populations.

Another central concept within all models of stress, that is examined in the
paper concerns social support. There are questions detailed in the paper that
concern things like the multidimensionality of support. What is support actually
doing for people? People have distinguished among types of support, looking at
tangible aid, emotional support, and informational support; also some people
claim that it’s the opportunity to obtain self-comparative information that is so
beneficial, and so on.

It should be pointed out, though, that while we have many demonstrations that
support is important and beneficial, much of that literature, and probably most of
that literature, is open to alternative explanations, one of which is a personality
confound. It could be, for example, that people who have a lot of support are
also generally more outgoing, gregarious individuals, who have fewer mental
health problems.

Another important point the paper makes concerns social support and life cycle
transitions. We are just beginning to look at the kinds of support relationships
that emerge over the life cycle and how they change with time as a function of
the roles the individual occupies. It is obvious to most of us that the kinds of
friends one has, the kinds of help one gets and expects from life, and the people
around you differ dramatically as a function of what you happen to be doing, how old you are, the kinds of responsibilities you have, and so on. To date, that kind of thinking has only rarely shown up in the social support literature.

Let me move finally to some methodological issues with respect to research in this area. The designs of choice that have been advocated in the last few years within the stress-coping context are for the most part prospective longitudinal studies. In these designs, you minimally want to have three measurement intervals. You start out with some population, which is then followed longitudinally, and a variety of data or similar data are collected; ideally, identical data are collected over those three intervals.

Using naturally occurring stressors, such as the onset of a chronic illness, or a handicapping event such as stroke as a starting point, one looks at what happens to the population over time, both with respect to the victim who experiences the event and those around him, or the social support system that has to cope with the event itself. There are two simultaneous interacting coping strategies involved to take care of situations like this. We have available to us now, and over the last 6 or 7 years, analytic strategies and structural modeling techniques that allow us to derive from that type of paradigm the causal statements that everyone has been groping for in the last 10 to 15 years in pursuing this kind of study.

With respect to the many questions that are raised for future research at the end of the paper, I was delighted to find that the authors were sensitive to avoiding the reinvention of the wheel.

There is also the temptation, given that we have these models and existing paradigms, to plug in culture as a variable and see what happens. I don’t think that’s a very productive way to proceed. It negates much of what has been done. It’s more important and more useful, I think, to focus on specific critical issues in the culture-stress-coping axis that answer important theoretical questions, questions that are useful in a cultural context, but at the same time, inform our understanding of stress-coping models in general. This is one of the many important contributions of the paper.

Dr. Bloom: What about the health part of this? Both you and Norm emphasize the stress part. What’s the link to health? Did you avoid that on purpose?

Dr. Dinges: No. As I mentioned, stress has been implicated in virtually every disease category ever defined. The problem is that the causal mechanisms are virtually unexplored, and it’s unclear how you proceed to do that, and what measures you need to take. We were trying for a level of abstraction here that maybe was a little off-center, but we chose that model. I don’t find much in the literature I have seen that makes a direct link. There are lots of correlational studies, but nothing between stress and health outcomes which specifies causal
mechanisms. Most of the research cited comes from laboratory studies; it’s not field research, it’s not research in the wide open sociocultural context, and none of it, as I recall, dealt with anything like a cultural factor.

Dr. Schulz: Let me play the devil’s advocate for a moment and say that if you’re going to look at the mediation of stress to illness explain the mechanism, I’m not sure culture is a relevant variable. The level of analysis becomes so microscopic on the one hand, and the problem becomes so generic on the other hand I’m not sure culture becomes a context within which you would have to investigate that relationship.

Dr. Manson: Well, let me take issue with you in thinking you need not attend, or probably cannot attend for the sake of parsimony, to culture with respect to that link between health and stress. Culture, from my point of view, is paramount in the definition of illness outcome, thresholds of impairment, and other kinds of perceptions. Family members and other people reaffirm the fact that there is a state of health or state of illness and thus describe and define the outcome you’re interested in. I think it’s at that level the cultural component becomes critical.

Dr. Schulz: I agree. When I am describing the identification of biological mediators, I have totally left the world of perceptions momentarily, to try to isolate those mediators. We have left the world of perception at this end in the sense that we are not worried about how a variety of events are interpreted by the individual, we just start out with a given event that we’re reasonably confident is stressful for everybody, and we look at an outcome without caring how it’s perceived by the victim. As objective observers, we are satisfied that we have a health-related outcome, but you’re obviously right.

Dr. Bloom: One follow-up. I think the model is critical, and I think what Spero said needs to be incorporated into the model you choose to illustrate the situation we’re trying to get at. We should develop one that has these cultural contexts right within the model.

Dr. Dinges: The general stress paradigm does incorporate cultural factors in most of the components of the model but the problem is to operationalize them.

Dr. Schulz: There is almost this infinity of conditioning variables; that’s where culture shows up.

Dr. Bloom: They are all in there, but I’m saying the model coming out of this conference should have these areas much more explicitly integrated.

Dr. Dinges: Well, depending on how big you want to make these boxes representing the various components, you can get in anything you want—it just goes on and on. That’s part of the problem. How specific are we going to get? How are we going to operationalize culture in this type of model?
Remember, we chose this because it was a good schema with which to incorporate a lot of variables. You could have taken these lines to right here (indicating), and I think that’s probably what Rich is talking about. Stress appraisal models would suggest that internal mediators will take in some presumably objective stressor and can modify that significantly. Whether you define it as threat, challenge, opportunity, or neutral to you, then your secondary appraisal based on your self-assessed ability to cope with it, and then the reappraisal based on whether that changes from a threat to a challenge, are all things we don’t explore. We started another section on that and decided the paper was getting too lengthy. We intend to incorporate that material in the revision. The most recent book by Folkman and Lazarus, on stress appraisal and coping, deals with that, including general and specific models of personality-mediated health outcomes. I’m not sure how specific you want to get, Joe.

Dr. Bloom: What I’m trying to say is that you’re correct; that it’s there. In order to make it explicit, you have to translate some of these cultural issues, as Spero has said, clearly into the model. The model that comes out of a conference like this should have a cultural and even a family mediation part that’s very clear.

Dr. Dingess: I think one of the sections on health belief models and representational systems deals with that in our paper, and Sandy might want to speak to that. We chose this as a big picture; there are figures throughout the rest of the paper that deal with social support, perceived control, and that kind of thing. These sections take one of these mediators and expand on it.

Dr. Joos: There are models that fit within each of these boxes, and it gets to a point where you have to choose one as a manageable context in which to discuss these issues.

Dr. Dingess: Let me suggest, that to get enough of those components into a model you’re going to wind up with a general level of cultural definition. You’ve got to get down to intermediate models, or midrange models, to start to get specific with cultural variables.

Dr. Schulz: Well, I think it would be possible to take generic categories, such as social support as a mediating or conditioning variable on the stress-coping-health relationship, and operationalize it within the context of specific cultures. The assumption obviously is how social support plays out, what it does, and its structure. Its function is going to vary from culture to culture, and it would be valuable, I think, to be able to have enough details to talk about social support in a particular cultural context.
Dr. Callaway: Do you think if you took your models and had models within models within models within boxes, that the number of conditioning variables is so large that even if you identified a very good causal model of 10 different cultures, you could say that the difference between the outcomes was due to culture?

Dr. Schulz: That’s a good question. That’s sort of putting the cultural hypothesis to the acid test.

Dr. Shore: I’d like to make two points. One, I think there is a seduction and risk in working in any transcultural setting, in this case with American Indian issues, of focusing just on culture and not state-of-the-art research models that can be applied to the field. If we reject those methods because they aren’t perfectly adapted, not only to American Indian culture but to all the complex issues of the different tribes, and therefore don’t apply them, we have to totally invent not only new models but new methodologies. The field will leave us behind by centuries, and knowledge about American Indian disorders, in my opinion, will never advance. We have got to find ways to take those methods that are being applied currently to White middle-class Americans or White middle-class males, and use those methods as best we can in sensitive cultural adaptations without spending too much time, that is, another decade or two, focusing just on cultural differences. If we don’t, that body of knowledge is going to advance and we won’t have the applicability of that knowledge to any special minority groups. That’s a difficult thing, because it involves a lot of theoretical compromising.

My second point is that I think there isn’t any area less written about than the area of grief reactions in American Indians. I think it’s phenomenal the amount of loss and grief the American Indians go through and how little descriptive research data there is in that area. If one could pick one clinical model of the stress syndrome that we all acknowledge is important but is tremendously underrepresented, I think it would be that area, and I hope we do get back to it in our subsequent discussions.

Dr. Neligh: In this particular area, a number of issues from a medical perspective certainly deserve looking into. Some of these factors may be genetically different among Indians in comparison with non-Indians. Several differences in the epidemiology of some physical illnesses suggest a disparity in immune response between Indians and non-Indians. Particularly the photodermatitis of Plains tribes, patterns of arthritis, and the historic response of Indians to tuberculosis indicate differences in T-lymphocyte activity among Indians. Some of those things certainly affect the immune responses. Then also, some of the things that Al Levy and his colleagues describe, with diurnal variation in life cycles and the effect of that on immunology, particularly for
Alaska Natives, might be a productive area. So just from a field clinician's perspective, all of those physiologic mediators that may be genetically related certainly would be good to look into.

**Dr. Ghodes:** I'd like to expand on past immunology. That's a neat thing to look at these days, because people discovered T-cells and D-cells playing around in the laboratory. We are looking at more fundamental issues, endocrine issues, for example, catecholamine metabolic, and stress-caused catecholamine release. All catecholamines are handled the same in different tribes, although there are some genetic differences. There is some suggestion there may be some difference again, and NIMH and CRC in Phoenix may turn out some actual data that we'll have to test in other tribes. But I think we really need to look at stress in a lot of ways. Lithogenic bile and gall bladder disease—what relationship does stress have on that? There are numerous questions that need to be asked.

**Mr. Whited:** I'm a little disturbed that we are talking about stress and nobody has defined it. We're trying to call this thing the cause and stress comes in a lot of forms; there is economic stress, social stress, and biological stress. When you're generalizing this stress issue and not breaking it down into smaller, perhaps more specific, impacts and neglecting to define this thing called stress, but building large models for it, you're leaving me as a field provider with a large hole to fall into.

**Dr. Dinges:** I don't think the issue of stress is ignored. The problem is that the stress appraisal models have become regnant and virtually anything that anybody has ever wanted to define as stress has been so defined in the past. That's been largely nonproductive. Now people are saying you have to introduce the perceived stress on a person, because the individual variability in reaction is so wide to the same presumably objective stressor, natural disasters and so forth, that you cannot demonstrate profound and strong direct correlations between them. Something is clearly mediating, and that seems to be the subjective appraisal process, as well as identifiable external mediators. So you can proliferate definitions of stress. We cited a number of classic definitions in Kasl's most recent review on stress and health in which he identifies four major uses of it. But the confusion between the stimulus and response characteristics of what we call stress continues. I suggest we introduce the stress appraisal element and let stress be what people perceive it to be, then move on.

**Mr. Whited:** I was kind of pleased with your last model where the onset of biological disorder was what precipitated the stress.

**Dr. Dinges:** Clearly. And that may be one of the more useful hypotheses. We have to understand existing conditions in Indian communities and the presumably stressful life events which are exacerbating the subclinical degrees of pre-existing and undiagnosed conditions. There is a substantial literature on coping with the stress of illness once it's diagnosed, defined, and accepted by the
patient. That’s another form of stress/coping and health outcome. Most of the Indian health literature focuses on single disease categories even though there may be multiple disease outcomes as a result of exposure to major stressors. The literature suggests and strongly encourages examining multiple disease outcomes in much greater detail in future studies.

**Dr. Walker:** Those of us interested in culture and coping, stressful life events, and how these interact with the rest of medicine, need to be much more in focus with the way we use those terms. That’s one of the problems we’re struggling with now. When we talk about culture as an important issue in looking at health outcomes and illness outcome, what variables are we talking about? How do we measure that? What are the criteria we are scientifically going to follow in these longitudinal studies? It’s critical that we look at these variables and justify the existence of this kind of research. I don’t think it’s an accident that we were left out or that these issues weren’t covered in *Health and Behavior.* As we all remember when this was going on and being published, the interest in the administration was to take the social sciences out of research; a lot of people are asking us to justify our existence.

Now, on the positive side, you have brought up in your models the issue of coping. I feel positive about that because the coping mechanisms and research going on have direct, practical implication in patient care. Those are models we can begin to use on the reservations. We have to remember, however, that they are very difficult to incorporate and it’s still a research model. Certainly in alcoholism there’s a popular arena in changing drinking styles and drinking behaviors. It offers a great deal of promise.

Other areas we need to look at in this arena have to do with the definitions we’re using, as you were implying about stress, and clearly, culture. We all know that culture and tradition reflect on patient care and outcome, but we can’t figure out the relationship in a measurable way. That’s been my struggle, and I think that’s some of the optimistic work. We try to look at mental health and mental illness. That’s where we need to emphasize that there is something here. We need to begin to develop a model that will take those into consideration in a way more acceptable in the scientific community.

**Dr. Manson:** I have two basic concerns. One is to reinforce my fear that we are going to reinvent the wheel and spend a great deal of energy, resources, and time rediscovering things that are already well established in various literatures. I think, frankly, we have a tendency to do that in connection with Indian and Native research. It’s part of the pseudospecies arguments we’ve used to justify and rationalize the funding of the work we have been involved in. I’ll come right out and put that on the table, as the heretic. I hope that, indeed, we can be informed by the variety of different literatures represented in these areas.
The second major concern is an increasing pessimism that three-way panel
designs like this are the way in which to test empirically these models. Even
presuming we can achieve consensus with respect to how those models ought to
look, the pragmatic conditions, in my experience, legislate against the kinds of
elaborate designs and longitudinal efforts required to test these empirically. A
number of us have been struggling with empirical studies like this: prospective
longitudinal studies. The attrition, the refusals, and the variety of other kinds of
historical events intervening between waves of representing plausible alternative
explanations for possible changes are extremely frustrating. If we do trot out
longitudinal designs like this as the ways to test these models empirically, they
aren't going to get tested in Indian country.

Dr. Schulz: With respect to the three-wave, four-wave, or whatever kind of
longitudinal design you're looking at, there are short longitudinal studies. You
can do a longitudinal study in 8 months if your questions are focused enough that
they get into a problem that plays itself out over that short period of time. What
very often happens is that when you attack a new area, a new conceptual domain
within another context (i.e., stress coping within the cultural context), you get the
entire repetition of that research domain as it has evolved in its original context.
What we don't want to see is a bunch of studies that generate lists of stressful life
events, or a bunch of studies that look at the relationship between the Holmes
and Rahe Life Event Scale and some health-related outcome in the context of a
particular culture. I don't think that's very interesting or very useful.

So given what we know, and what has already been done, I think it's important
to do the most sophisticated work possible.

Dr. Manson: My comments are on the realities one should expect. I would
hate, for example, to see the NIMH Minority Center set aside a lot of money to
fund one major multiple-wave panel design with respect to a broad set of issues
in Indian country and have many of us disappointed in the subsequent outcomes.
Specificity of the problem and the temporal aspects of the presumed dynamics in
coping with the stressful outcomes of these problems seem highly critical in the
selection of studies, and in the investment of resources.