

STRESS AND HEALTH IN A COLORADO COAL MINING COMMUNITY

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ABSTRACT

The purpose of this study was to relate community environment and individual functioning using a newly developed conceptualization for community needs assessment. The frustration of basic human needs is viewed in the conceptualization as an explanatory link between environment and pathology, and information about basic human need frustration is therefore of relevance to community planners. This study of a Colorado coal mining community was conducted as follows: (1) interviews were carried out regarding life circumstances for different age and sex groups; (2) interviews were analyzed regarding subgroups' opportunities for basic human need satisfaction, and a self-report instrument was developed to assess basic human need satisfaction, health, and mental health; (3) 138 community members were surveyed utilizing the instrument; and (4) survey data were reduced and analyzed. The researchers did not successfully predict self-reported patterns of need satisfaction on the basis of community interviews, but a significant relation-

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ship was found between self-reported indicators of need frustration and self-reports of mental health problems for five of the eight community subgroups. A significant relationship was found between self reported indicators of need frustration and self reports of health problems for four of the eight community subgroups. The utility of the conceptualization as a preliminary basis for community planning was supported.

Social scientists have for many years sought to define the relationships that exist between social system contexts and the physical and mental health of individuals. The idea that environmental variables make an etiological contribution to individual function or dysfunction is an appealing one, in part because it may be possible to make changes in social systems to remedy problems that are identified. There does not yet exist an established and comprehensive conceptualization of the relationship between community environment and individual functioning. What seem to be needed are theory and techniques that provide a rational basis for selecting information about social systems and individuals in order to make fruitful resource allocations. In this inquiry into a rural subculture, a conceptualization was developed and applied in order to assess human need satisfaction and its relation to physical and mental health for subgroups of persons there (Lasater, Note 1).

THE STUDY OF ENVIRONMENTAL INFLUENCES ON PATHOLOGY

A central assumption in the study of environments is that external circumstances have an impact on persons and thus result in psychological and physiological states of clinical significance. Selye (1952) was one of the original theorists who dealt with the relationship between health and stress. Levi (1974) presented a conceptual model of psychosocial stress and disease that included six sets of variables relevant to an individual's experience of stress and reaction: (a) psychosocial stimuli, (b) psychobiological program, (c) mechanisms, (d) precursors of disease, (e) disease, and (f) interacting variables.

Because the notion of stress serves to link environmental conditions and subsequent states of persons, investigators have formulated various accounts of which psychosocial conditions produce stress. One such model is the research approach pioneered by Holmes and Rahe (1967) which has resulted in a focus on the adaptive behavior required by life-events as a probable precipitating factor in the onset of both physical and mental symptomatology. More recently, researchers in this area have also explored social support as an important variable modifying the impact of life changes on individuals. Published evidence documents a relationship between the presence of stressful life-events, the absence of social support, and the occurrence of mental health problems (Williams, Ware, & Donald, 1981).

The combination of life-events and the absence of social support appears insufficient as a general explanation of how environments produce individual pathology. In the area of mental health needs assessment, it is necessary also to take into account the differences in opportunity for individuals provided by different environments which have been related to rates of psychopathology. Faris and Dunham (1939) found that the incidence and prevalence of psychosis was greater in the central slum sections of Chicago and lower in the suburbs. Srole, Langner, Michael, Kirkpatrick, Opler, and Rennie (1962) found relationships between demographic and sociocultural variables and psychiatric disorder in New York City. It seems probable that life-events and the absence of social support were factors influencing the findings from these two landmark epidemiological studies, but in relating the environment to individual functioning, exposure to events requiring significant adjustments and the absence of social support are merely two examples of conditions that involve the frustration of basic human needs. The thesis of this paper is that the sorts of events or lack of opportunity for persons that result in stress and pathology are most likely to be those that frustrate the human needs of individuals, and particularly those that frustrate basic human needs.

A. H. Leighton (1959), in the Stirling County Study, provided this direct and essential bridge between the individual and his environment by focusing on ten "essential striving sentiments" or human needs. He sought to relate the occurrence of mental disorder to interference with human need satisfaction resulting from social disintegration in several rural Nova Scotian communities. By comparing the incidence and prevalence of disorder in the communities that they studied, D. C. Leighton, et al. (1963) concluded that limitations in the opportunities for need satisfaction were associated with the prevalence of psychiatric disorder. Because the concept of basic human needs potentially subsumes life-event changes, absence of social support, and other individual explanatory variables related to pathology, need satisfaction was viewed as a fruitful way of understanding individual functioning in a community in the present research effort.

Because it was the intent of this research to generate information that would provide planning information based directly on individuals' response to their unique and particular environment, the focus of this project was on social structure, opportunities for need satisfaction, and likelihood of need frustration. The research conceptualization provided a rationale both for professional assessment of opportunities for need satisfaction and for the assessment of individual perception of need satisfaction utilizing survey methods.

ENVIRONMENT AND PSYCHOPATHOLOGY IN INDUSTRIAL POPULATIONS

The modern industrial system is an arena where the psychological functioning of workers is a pressing concern. Numerous researchers have documented the rela-

tion between job environments and the psychological adjustment of workers (e.g., Kornhauser, 1965; Ginzberg, 1967; Gross, 1970; Gardell, 1971; Austin, 1977). A general finding is that workers' perception that their job does not give them a chance to use their abilities is strongly related to mental health problems. In addition, it is viewed as important that in rationalized, large-scale industries, large groups of employees have been prevented from taking part in the planning and control of their own work. Severe restrictions in worker freedom and control appear closely tied to alienation.

Because mental health services are frequently unavailable or inaccessible to industrial populations, the industrial context is viewed as a fruitful setting for preventive mental health planning (Austin, 1977). It thus appears that a clear understanding of basic human need frustration among workers would provide direction and guidance to intervention efforts.

Within the industrial system, coal miners have faced extremes of economic hardship, danger, and physical demand, and appear to be an appropriate group for a study of the relation between environmental circumstances and individual functioning. Coal miners and coal mining communities have not been the focus of a great deal of research in the field of mental health, but there have been several research reports on this group from the fields of medicine, industrial psychology, and sociology over the past thirty years (Collison, 1947; Trist & Bamforth, 1951; Lantz, 1958; Peterson, 1972; and Powell, 1973). Because of the dangers involved, the safety and health of miners has been a constant concern not only to miners and their families but also to the industry. A coal mining community was thus chosen as a suitable location to study the relationship between community environment, basic human need satisfaction, and health and mental health.

A CONCEPTUALIZATION FOR MENTAL HEALTH NEEDS ASSESSMENT

The requirements of a conceptual model upon which to base a community mental health assessment are straightforward. The model must identify aspects of the opportunity or lack of opportunity available to persons within certain demographic categories so that the implications of their social positions for need satisfaction become evident. In addition, the model must guide a data collection procedure. The model presented below meets both these requirements.

Needs, Pathology, and Basic Human Needs

In the psychological literature "need" is often used to designate motivational concepts. For example, "Need Achievement" is used to refer to a certain kind of achievement motivation. In contrast, in Descriptive Psychology a need is defined as "a condition or requirement which, if not met, results in a pathological state"

(Ossorio, 1978, p. 61). Pathological state refers here to a restriction in one's ability to participate in the social practices of the community. For example, a broken leg is considered a pathological state because a person with a broken leg cannot do everything that persons without broken legs can do. Similarly, in the psychological realm, a person with an authority conflict that prevents him from interacting with various authority figures in accordance with accepted standards of civility and restraint, and accordingly prevents him from supporting himself and his family, is considered to be in a pathological state. The definition pertains to individual pathology and clearly separates behavioral restrictions, that result from absence of *ability* from behavioral restrictions resulting from absence of *opportunity*. In considering origins of social pathology, it is necessary to talk in terms of opportunity, but in this definition of pathology, only behavioral restrictions resulting from absence of ability are included. For example, being in jail results in an inability to participate in certain social practices of the community, but it does not constitute a pathological state.

The above nonmotivational concept of need is highly compatible with the general rationale for conducting "needs assessments," and, specifically, for conducting mental health needs assessments. A general rationale for mental health needs assessments is that a given population has needs, or requirements, which if not met, will subsequently result in new cases of mental pathology or in the exacerbation of existing cases of pathology. The assessment of the extent to which such needs are not being met provides indications for future pathology in the absence of intervention and provides some guidelines for possible intervention.

Most needs assessments to date, however, would be better described as pathology assessments. That is, the assessment procedure consists of gathering evidence that a given subpopulation has a relatively high incidence or prevalence of pathology (see Bloom, 1977). From such evidence one may conclude that some relevant needs were not met, but this deficit is not directly assessed. Such research provides some impetus to bring into play the treatment and prevention measures with which we are familiar, but only accidentally and incidentally provides suggestions for doing anything new that is specific to the situation.

Given the definition of "need" provided above, human needs are as variable as human histories. For example, one could say of a person that he needed to keep his job, and that it was as a result of losing it that he became paranoid. For another person, no psychological problem might develop. What is required is a common framework for talking about what people need in order to maintain mental health, and a stable set of need concepts that will be universally applicable. These requirements are satisfied by the notion of basic human need.

Previous researchers (e.g., Maslow, 1943; A. H. Leighton, 1959) have used the concept of basic human needs to denote central requirements for human functioning, which are universal rather than culture specific. There is some variation in which requirements are considered central by different authors. A

conceptual rationale is needed to provide criteria in order to avoid a mere impressionistic listing of requirements. For this purpose, a basic human need is defined here as "a condition or requirement, which, if not met, makes behavior impossible." Behavior, in this instance refers to the Deliberate Action necessary to engage in the social practices of the community. In Descriptive Psychology Deliberate Action is a case of Intentional Action where the person knows what he is doing and has also chosen to do it (Ossorio, 1978). Thus, the definition of a basic human need is an extension, or limiting case, of the earlier definition of human need as "a condition or requirement which, if not met, results in a pathological state." In the case of basic human needs the limitation on behavior is extreme, as it is expected to be the case that a person experiencing zero satisfaction of a given basic human need *will not be able to behave at all*.

For example, consider the case of the person who is seeking employment. Having a job or keeping a job is usually not one of those conditions which, if not satisfied at all, will make behavior impossible. In contrast, for illustrative purposes consider the person who has zero satisfaction of the basic human needs for Order, Understanding, and Predictability, or the person who has zero satisfaction of the basic human needs for Adequacy and Competence. (Needs from the list developed for the purpose of this study will be presented later.)

Behavior requires that you act on a discrimination—that you distinguish something from something else. But the act of discriminating something from something else introduces, to that extent, Order, Understanding, and Predictability. Therefore, if your world had no Order, Understanding, and Predictability at all, you could not be making *any* discriminations, and it would be literally impossible for you to engage in Deliberate Action. You could not reliably pick a red versus a blue marble from a table, or even distinguish the marbles from the table, without in this respect satisfying the basic human need of Order, Understanding, and Predictability.

Similarly, behavior requires that your performance be the expression, to some degree, of Adequacy and Competence, in order that when you try to do something, your success is not just accidental. For example, going out to the hallway to drink at a fountain involves balancing your body in just the right manner to remain upright, placing your feet in just the right way to move out to the hallway, and bending in just the right manner so that your mouth meets the flow of liquid, and so on. If all those things that are necessary to the success of this behavior have no connection and no relation to what a person knows how to do, then it can be said that this happened to him—not that he did it. And in that case he would not have engaged in behavior. If a person had no degree of satisfaction of the basic human need for Adequacy and Competence, then nothing that occurred would be the case of something that he did, and so there could be no behavior on his part, and it would be impossible for him to do anything.

The above conceptual definition of a basic human need provides a reasonable reconstruction of the character of the kinds of needs that appear on previous lists

of basic human needs (e.g., A. H. Leighton, 1959). The definition also makes it understandable why it is that different theorists can develop different lists. Namely, there is no reason to expect that there is a single set of categories for stating the necessary conditions for human behavior. The fact that different theorists develop different lists illustrates the fact that there are various ways of stating these necessary conditions. However, although these lists are literally different, they are not entirely unrelated, and there is a considerable amount of communality and family resemblance (e.g., Maslow, 1943, and A. H. Leighton, 1959). The differences among the lists are to be regarded as differences in what they bring out clearly and what they leave implicit. For different purposes different lists might be preferable in order to bring out particular facts that are relevant to that purpose.

The particular list used for the purposes of the present study was chosen in an attempt to bring out the kinds of facts that seemed particularly relevant to mental health issues. There is a substantial overlap between the list used in this study and the types of basic human needs presented by A. H. Leighton (1959) in the Stirling County study. This communality, along with reliance on the above conceptual definition, provides reasonable reassurance that the set used in this study was sufficiently comprehensive for descriptive purposes. The set of basic human needs used in the study is presented in Table 1. Also presented is a listing of social practices and relationships through which basic human needs appear to be most commonly met in U.S. culture at this time.

The social practices and relationships specified in Table 1 point to the sorts of dimensions of a particular sociocultural environment that can be taken into account in understanding the opportunities which are available in that environment to individuals for meeting their basic human needs. Basic human needs are not satisfied directly in abstract form; rather they are satisfied concretely through appropriate participation in the actual social practices of the community. Note here that environmental circumstances are expected to be a constraint on *opportunity* to satisfy basic human needs, whereas absence of basic human need satisfaction is expected to limit *ability* to behave (as in the definition of pathology).

If you specify (a) a set of basic human needs and (b) a particular cultural and social context, then you can talk understandably about something like a job being a need. For example, it could be the case that a particular person under sufficient financial duress with a family to support "needed" his job in order not to become depressed. The job in this case would represent participating in a social practice in order to satisfy a basic human need, in this case Adequacy and Competence. You can use "need" meaningfully in this manner only if (a) and (b) are specified.

One of the values of this conceptual formulation is that it provides a framework that is culture-free and context-free, but it also provides a manner of taking into account culture, context, and history for particular cases. That means that

Table I
Basic Human Needs and the Common Social Practices
and Relationships for Meeting Them in U.S. Culture

Physical Health: (a) maintain an adequate diet; (b) obtain sufficient sleep; (c) engage in regular physical exercise; (d) secure adequate shelter; (e) access medical and dental care; (f) make an adequate living or obtain other means of support; (g) work in a safe environment.

Safety and Security: (a) live in a protected residence in a safe community; (b) access to police and fire protection services; (c) access to medical and dental care; (d) make an adequate living or obtain other means of support; (e) access to necessary means of transportation; (f) work in a safe environment; (g) obtain job security and retirement benefits; (h) secure insurance, savings, or other financial reserve.

Self-esteem and Worth: (a) develop and maintain a good physical self-image; (b) understand and accept one's personal strengths and limitations; (c) develop and maintain a loving sexual relationship; (d) attain the respect and acceptance of significant others; (e) create and raise children in the family unit; (f) resolve major developmental tasks and life crises; (g) live in a way that affirms one's essential values; (h) attain status commensurate with personal aspirations; (i) attain economic self sufficiency; (j) maintain a positive personal identification with a valued group.

Love and Affiliation: (a) develop and maintain a loving sexual relationship; (b) maintain a caring relationship with one's family; (c) develop and maintain meaningful friendships; (d) receive culturally appropriate demonstrations of affection; (e) express culturally appropriate demonstrations of affection.

Agency and Autonomy: (a) engage in self determining action; (b) express one's personal rights, wishes, and opinions; (c) express one's individuality and choose one's own lifestyle; (d) resolve major developmental tasks and life crises; (e) initiate and be responsible for successful activity; (f) take independent action which affects one's environment.

Adequacy and Competence: (a) develop and maintain a loving sexual relationship; (b) fulfill family roles and responsibilities; (c) develop and utilize skills at work and at home; (d) attain economic self sufficiency; (e) receive recognition for personal accomplishments; (f) attain occupational and social status commensurate with personal aspirations.

Identity: (a) accept one's own masculinity or femininity; (b) accept one's own racial and ethnic identity; (c) understand and accept one's personal strengths and limitations; (d) accept one's occupational role; (e) develop and act in terms of a religious philosophy; (f) develop and act in terms of a political philosophy; (g) participate effectively in definite human groups; (h) accept one's membership in a political or geographical unit.

Belonging and Acceptance: (a) participate with and receive appreciation and loyalty from one's family and friends; (b) participate with and receive appreciation and loyalty from others at one's place of work; (c) participate with and receive appreciation and loyalty from one's valued social, political, and religious groups; (d) participate with and receive appreciation and loyalty from other members of one's ethnic or racial group; (e) obtain membership in and receive acceptance and loyalty from members of the society in which one lives.

Disengagement: (a) spend time alone and undisturbed; (b) derive enjoyment from inactive participation in non-problem solving activities; (c) derive enjoyment from active participation in recreational activities; (d) derive enjoyment from creative endeavor; (e) participate in social activities with others.

(Continued)

Table 1 (Continued)

Order, Understanding, and Predictability: (a) participate in a familiar environment; (b) interact with others whose motives, behavior, and feelings are understandable; (c) live in a society which is governed by law and provides rights and freedoms to its members; (d) adhere to the social customs, behaviors, and laws of the society in which one lives; (e) understand and utilize governmental and bureaucratic workings; (f) understand and utilize community resources.

Personal and Social Legitimacy: (a) live in a way considered right and fitting by oneself; (b) obtain just treatment and recognition from one's family and friends; (c) obtain just treatment and recognition from one's valued social, political, and religious groups; (d) adhere to the social customs, behavior, and laws of the society in which one lives; (e) carry out sexual, family, social, and other roles in ways compatible with cultural values and social norms.

Meaning, Hope, and Significance: (a) develop and maintain a loving sexual relationship; (b) create and raise children in the family unit; (c) engage in satisfying activities in major areas of one's life; (c) engage in satisfying activities in major areas of one's life; (d) take action as needed to improve one's life; (e) fulfill family roles and responsibilities; (f) develop and act in terms of a religious philosophy; (g) undertake long-term enterprises; (h) act in ways that make a difference in one's own life and the lives of others; (i) accept one's own death.

you can talk about any given person, group, or population in this universal way, which allows for comparison or contrast with other persons, groups, or populations of any sort while at the same time permitting you to be responsive to the particularities of a given person, group, or population.

Conceptually, therefore, these needs are most understandable when one examines the concrete and identifiable ways in which they can be met. These ways are expected to vary according to an individual's personal characteristics and life circumstances. But regardless of the ways in which an individual's needs are ultimately satisfied, they must be satisfied through one of the social practices and relationships available to the individual in his community or society. Each environmental situation provides options for social participation that are both limiting and specific. Thus, in every life situation, an individual can be expected to be better able to satisfy some of his needs than others.

Different basic human needs are satisfied through participation in different sets of social practices and relationships. It follows from this that if a basic human need is frustrated, then either a set of social practices and relationships that could satisfy it is not available, *or* the person is not engaging in those available, *or* he or she is engaging in them in a deficient way.

Basic human needs are not considered motivational in this formulation, and people are not in general specifically trying to satisfy these needs. However, in a viable society, it is expected that the kinds of behavior in which people engage are the very sorts of behavior that would be chosen if people were trying to satisfy their basic human needs. This is understandable because, if you look at the list of needs, every one of them is something which, at face value, is desirable, and the lack of which is undesirable. Since the lack is undesirable, we may expect that when a given need is unsatisfied to a significant degree, the

person will feel dissatisfied and will be motivated to do something that reduces the dissatisfaction. If he succeeds in doing this, it is not unlikely that he will also have done something to satisfy the need that was previously unsatisfied.

For example, a person who has a significant lack of satisfaction of the basic human need Belonging and Acceptance is, in a practical sense, but not an absolute sense, an outcast. Being an outcast is, at face value, an unsatisfying condition, and we would expect a person to be unhappy or dissatisfied and to be motivated to do things to reduce that unhappiness or dissatisfaction. Given that the negative feeling resulted from being the outcast, one would generally expect (although it is not a logical consequence) that whatever this person did to reduce his unhappiness or dissatisfaction would be something that added significantly to the satisfaction of his need for Belonging and Acceptance, even if he had not figured out that that was what he needed.

Implications for Community Assessment

Within the context of a particular community, certain regularities can be expected in terms of the kinds and variety of options for participation in the social practices and relationships that pertain to different subgroups of persons there. Because of these regularities in any community, it is expected to be more or less difficult for different persons to satisfy their basic human needs. In this approach, the regularities are conceptualized as community strengths and strains. Examples of strengths in the community studied would be the fact that the overall atmosphere was personal and that families were closely knit. These two facts provided the basis for the expectation that most individuals would have a reasonable opportunity to satisfy their need for Belonging and Acceptance. An example of a strain in the community would be that there were very few job opportunities available for women, and it could therefore be expected to be difficult for some women to satisfy their need for Adequacy and Competence.

In a particular social structure it is expected that regularities can be identified that are either facilitative of basic human need satisfaction or counter-facilitative, in that they act as barriers, difficulties, deterrents, and so on. Whether you have a strength or strain for that social structure will depend on the whole set of regularities and their overall facilitative or impeding effect. Because the whole set must be considered, the community must be analyzed so that researchers may take into account strengths and strains pertinent to a given need for a given group. A community analysis utilizing this approach includes gathering general facts relevant to basic human need satisfaction for all targeted demographic subgroups in a community. This pooling of facts then makes possible the estimation of the average degree of specific need frustration that would result for different demographic subgroups in such an environment.

There are a variety of ways in which the failure to satisfy basic human needs might be manifested. Among these, three general kinds stand out as relatively

direct and accessible manifestations that are consistent with the range of need frustration and stress symptoms identified by previous researchers (D. C. Leighton, et al., 1963; Holmes & Rahe, 1967; and Levi, 1974). The three general kinds of symptomatology resulting from basic human need frustration identified in this conceptualization are the following:

1. Physiological concomitants of stress and their consequences over time (e.g., ulcers, high blood pressure, or heart disease).
2. Behavioral expressions which could be classified as displacements, compensations, or symbolic behaviors (i.e., arguing, drinking to excess, fighting, unsafe driving, quitting jobs, etc.). For example, a person whose needs for Self-esteem and Worth and Personal and Social Legitimacy were strongly frustrated in his occupational setting might compensate by affirming these needs elsewhere, for example, by acting self-righteously and argumentatively outside of his occupational context.
3. Cognitive or emotional reactions (i.e., attitudes, feelings, and beliefs that persons hold regarding themselves, others, or their life situations). For example, someone whose economic situation is precarious might well develop a generalized feeling of fear and tension (as well as accompanying physiological correlates). A person for whom it was a matter of family tradition and economic necessity to work in a physically dangerous occupation might well adopt a fatalistic philosophy of life and act passively as a result.

The Development of Hypotheses

The preceding conceptualization presents an approach to the systematic assessment of community needs. The approach (1) includes the specification of 12 needs which are considered basic to human functioning; (2) provides for analysis of how the circumstances of life in a particular community work either as strengths or strains by providing or limiting opportunity for participation in social practices and relationships by community members; and (3) specifies the kinds of effects that can be expected to be manifested by individuals faced with basic human need frustration.

Consistent with the rationale presented above, the conceptualization leads to the following general hypotheses:

- HYPOTHESIS 1.** *On the basis of a judgmental assessment of community circumstances, it is possible to predict modal patterns of basic human need frustration for particular subgroups and patterns of differences in need frustration between subgroups.*

HYPOTHESIS 2. *The lack of satisfaction of basic human needs in any substantial degree results directly in correspondingly severe psychological consequences and, over time, in a set of correspondingly severe physiological consequences. These consequences include both pathologies and conditions associated with pathology, and may be manifested in the forms of psychophysiological concomitants of stress and their consequences over time, behavioral expressions which could be classified as displacements, compensations, or symbolic behaviors, and cognitive or emotional reactions.*

METHOD

Procedure

Project site. The area chosen as the site of the study was the town of Paonia and the surrounding area, a coal mining center in western Colorado. The area was considered appropriate for study because coal mining had been an established part of community life there since the early part of the century. Six hundred miners were employed in the community, and the subcommunity of miners and their families consisted of 1,600 persons from the total area population of 15,000 persons.

Community interviews. Seventy interviews of individuals in the community were completed during the summer of 1976. The research had received sponsorship from the United Mine Workers of America Health and Retirement Funds, and this sponsorship was critical in securing the cooperation of community members. All interviews were carried out by the author and by another advanced graduate student in clinical psychology. Only one of those persons whom we sought to interview refused our request.

It was the researchers' intent in the interviews to gain a comprehensive understanding of the facts and circumstances of life for persons in the various age and sex groups in the coal mining community. The interview schedules used were open-ended in orientation, with general questions that encouraged respondent discussion of many life areas. Groups interviewed included active and retired miners, miners' wives and family members, high school students, school officials, mine operators and supervisors, clergy, community leaders, and health care delivery personnel in the area. In addition the researchers attended union meetings, took orientation tours at two active coal mines in the area, and met informally with miners and community persons at local restaurants and bars.

Interview analysis and questionnaire development. The information gathered in the interviews was taken down in verbatim transcripts and reviewed by the research team. A listing of facts about the community was developed, including forms of social participation that were available for basic human need satisfaction. These facts were considered to include the major dimensions of strength and strain relevant to the lives of members of the deep coal mining community in the area. During the community interviews, it became apparent that the relevant age and sex divisions within the community paralleled the early, middle, and late stages of a coal miner's career, and the community was divided accordingly, as described below.

As the researchers reviewed the community facts, sets of questionnaire items were developed that could be used for a self-report assessment of frustration of each basic human need. Individuals in the community were divided demographically into subgroups as follows: Retired Miners; Retired Women (wives of retired miners and widows); Older Miners (ages 35 to retirement); Older Women (wives of older miners and widows); Younger Miners (ages 18 to 35); Younger Women (wives of younger miners); High School Men (high-school-age sons of younger and older miners); and High School Women (high school-age daughters of younger and older miners).

The questionnaire items were developed specifically to sample aspects of community and mining life pertinent to the subgroup and need in question. Some items were used across several or all groups to assess a particular need, and other items which addressed the situation of a specific subgroup were included as well. For illustrative purposes, the questionnaire items used to assess need frustration for each group on "Love and Affiliation" are presented in Table 2. In general the sets of items were chosen as the operationalization of basic human need frustration because they pertained to dimensions of persons' lives which, according to the construct, would be expected to be answered differently by individuals who differed either in need frustration or in opportunity for need satisfaction.

Because resource limitations prohibited the assessment of "behavioral expression," the self-report assessments used in this study dealt only with the categories of "physiological concomitants of stress and their consequences over time" and "cognitive or emotional reactions." Twenty-eight items dealing with common illnesses and physical problems were used to measure health status, and 21 items indicative of anxiety, depression, psychosomatic problems, alienation and anger were used to measure mental health status. (See Lasater [Note 1] for item content.)

Because the population to be studied consisted of persons who were currently employed or who had successfully completed their careers, it was expected that the frequency of severe mental health pathology would be quite low. A review of self report scales similar to that used in our study indicated that such scales are adequate for the assessment of general emotional discomfort, neurotic symp-

Table 2
 "Love and Affiliation" Need Satisfaction Assessment Across Subgroups

Item	Items Used in Need Factor for a Specific Group Are Indicated By X ^a							
	RM	RW	OM	OW	YM	YW	HSM	HSF
30. Older people are largely ignored in this community.	X	X						
86. It is easy to feel isolated here.	X	X	X	X	X	X	X	X
96. I don't get the chance to be with friends as much as I would like.	X	X	X	X	X	X	X	X
110. I regularly visit with friends in their homes.	X	X	X	X	X	X	X	X
41. Working swing shift or graveyard puts a strain on a miner's family or social life.			X	X	X	X		
69. Being a coal miner allows enough time for a full family life.			X	X	X	X	X	X
63. It is satisfying for a woman to concentrate her efforts on home and family.				X		X		
18. The values of young people here are different from those of their families.							X	X

Note: "Retired Miners = RM; Retired Women = RW; Older Miners = OM; Older Women = OW; Younger Miners = YM; Younger Women = YW; High School Men = HSM; High School Women = HSW.

tomatology, and psychosomatic disorders, but are not adequate for the assessment of psychotic behavior, organic brain syndromes, mental retardation, and sociopathic behavior (Schwartz, Myers, & Astrachan, 1973).

A questionnaire was developed utilizing the basic human need items, mental health items, and physical health items. Five different scale formats were developed that were appropriate to the variety of content and phrasing among questionnaire items. General questionnaire items and basic human need frustration items were arranged in a sequential manner that provided a mixture of content categories. To control for response set, basic human need items were written in such a manner that endorsement of an item indicated frustration on 50% of the items. Mental health, health items, and more personal demographic information were presented in separate sections at the end of the questionnaire.

Community survey. During April of 1977, a sample of 196 community members was drawn utilizing the files of the United Mine Workers of America Health and Retirement Funds Western Regional Office in Denver. The sample was selected as follows: (1) 150 families were selected at random from the

current listing of health card holders; (2) utilizing files of family members' names and ages, potential respondents were selected from these families. Within each target household, both husband and wife were selected as respondents, and if available, one child of high school age. This procedure was followed until what was considered a sufficient sample of persons had been identified in each demographic category. The 47 persons who were coal miners or from mining families who had taken part in the community interviews during 1976 were also included in the sample, since many of these persons had expressed interest in participating in the survey, so that this sample could be added to the target sample in the case that sufficient respondents did not participate from the target sample to permit analysis.

During May of 1977, a community survey was carried out. A special projects class at the local high school aided the author in distributing the mail-back questionnaire to 155 persons from the target sample and to the 47 persons from the interview sample within an approximately 100-square-mile area. A follow-up phone call was made to those respondents who had not returned their questionnaires after two weeks, and a postcard was sent to those who had not replied after one month.

During the survey, 155 persons of the 196 in the target sample were contacted and accepted participation in the study, or 79.1% of the target sample. Of these 155 persons, 106 or 54.1% of the target sample completed and returned their mail-back questionnaires. Of the 47 persons from the interview sample to whom questionnaires were distributed, 32 or 68.1% returned their mail-back questionnaires. The cell sizes that resulted in the target sample were barely sufficient for analysis, and accordingly the 32 persons from the interview sample were added to those from the target sample to compose a total sample of 138 persons. Although it was necessary to compromise the original sampling plan, the combined sample was considered adequate for the purposes of the study because of the unbiased procedures used to select both samples. The combined rate of return for the overall sample was 56.8%. A return between 50% and 70% is good for a community survey of this type.

Data reduction and analysis. Three independent sets of indices were developed for each of the eight subgroups in the study. The first was based on researcher judgments of need frustration for each group as indicated by the community facts gathered in the interviews. The second estimate of need frustration was derived from respondent self-reports to the sets of items developed to assess basic human need frustration. The third set of indices developed for each group in the study dealt with mental health and health symptoms. Multiple indices of each of the two estimates of basic human need frustration and of the estimates of mental health and health problems were needed because the theoretical formulation did not specify whether single, extreme basic human need frustration or multiple, less extreme frustrations would be more significant. The

same kinds of indices were developed for mental and physical health symptoms and are now briefly described here.

Experimenter judgments. (a) Rated Group Basic Human Need Frustration (for each need for each group); (b) Rated Group Extremity of Basic Human Need Frustration (average of those frustrations rated as greater than "slightly" frustrated); (c) Rated Group Unanimity of Basic Human Need Frustration (the percentage of needs for a specific group rated as greater than "slightly" frustrated); (d) Rated Group Total Basic Human Need Frustration (the mean frustration for each group across the twelve need frustration ratings).

Respondent self-reports. (a) Group Basic Human Need Frustration (the average of all group members' self-report indices of frustration from each basic human need factor); (b) Group Extremity of Basic Human Need Frustration (the average frustration across individuals on each factor and across needs for those needs which were frustrated greater than "slightly"); (c) Group Unanimity of Basic Human Need Frustration (the average percentage from all need factors for a particular group that were frustrated more than "slightly"); (d) Group Total Basic Human Need Frustration (the average need frustration across all basic human needs for all individuals in a particular community subgroup).

Group indices of mental and physical health. (a) Group Extremity of Mental Health Symptoms (the average score across individuals in each subgroup for those mental health items which were scored as present more than "slightly"); (b) Group Unanimity of Mental Health Symptoms (the percentage of mental health items of the total for all individuals in a subgroup which were reported present at a level greater than "slightly"); (c) Group Mental Health (the average score across all mental health items across all individuals in a particular subgroup); (d) Group Extremity of Physical Health Symptoms (the average score across individuals in each subgroup for those physical health items which were reported present more than "slightly"); (e) Group Unanimity of Physical Health Symptoms (the percentage of physical health items of the total for all individuals in a subgroup which were reported present at a level greater than "slightly").

Predictions derived from hypotheses. Prediction 1 is the operationalization of Hypothesis 1, and Prediction 2 is the operationalization of Hypothesis 2.

PREDICTION 1. *On the basis of a judgmental assessment of community circumstances by researchers, it will be possible to predict modal patterns of basic human need frustration reported by members of particular community subgroups and overall patterns of differences in need frustration reported by different community subgroups.*

PREDICTION 2. *Lack of satisfaction reported by respondents on the basic human need factors will be associated with correspondingly severe deficits in physical and mental health functioning reported on the questionnaire.*

RESULTS

Demographic Characteristics of the Sample

The 138 respondents who returned the mail-back questionnaire ranged in age from 13 to 83 years. Sixty-nine persons (50%) from the sample were male, and 69 (50%) were female. The sample included representation from the four towns situated in the river valley where the study was carried out. Included were data from 42 active coal miners and members of their families. The groups differed on characteristics that were used to define the study groups (i.e., age and employment status), and there were certain other differences of interest. Mean education as reported by the subgroups was early high school for Retired Miners and Retired Women, late high school for Older Miners and Older Women, and late high school and early college for Younger Miners and Younger Women. Approximately one-quarter of the Older Women were employed full time in contrast to 15.8% of the Younger Women. Responses from miners indicating years worked in mining confirmed the sample selection procedures, in that the three mining groups identified were those who had completed a full career in mining, those who had worked for many years, and those miners who were relatively new to this work.

Evaluation of Prediction 1

Through the procedures described above, the data were reduced to forms that could be used for evaluating the hypotheses. Results pertinent to Prediction 1 and Prediction 2 are considered separately below. Prediction 1 was pertinent especially to the question of the utility of carrying out an assessment of community needs by means of interviewer assessment of community circumstances. This question was relevant to needs assessment strategy in the field of mental health.

Research procedures provided independent estimates of basic human need frustration—researcher estimates of group frustration on each of the 12 basic human needs and respondent self-reports of frustration gathered by means of the questionnaire instrument. Researcher estimates were used to develop Rated Group Basic Human Need Frustration. Respondent self-reports were used to develop Group Basic Human Need Frustration scores as described above. In order to evaluate Prediction 1, the following analyses were carried out:

1. Need by need Pearson product moment intercorrelations were computed across groups utilizing Rated Group Basic Human Need Frustration and Group

Basic Human Need Frustration. Group by group intercorrelations were also computed across needs utilizing these two independent indicators of need frustration.

2. The overall Pearson product moment intercorrelation was computed across groups and across needs utilizing Rated Group Basic Human Need Frustration estimates and Group Basic Human Need Frustration scores.

Rated Group Basic Human Need Frustration estimates and Group Basic Human Need Frustration scores were not significantly correlated, either across groups or on a group by group basis. (See Lasater, Note 1 [Table 12, p. 135]) This finding implied that researcher estimates of basic human need frustration patterns among subgroups were not consistent with respondents' reports of same. The researchers thus weighed the implications of the circumstances of life in the community somewhat differently than did the respondents. This difference will be discussed later.

Evaluation of Prediction 2

In order to evaluate Prediction 2, the following analyses were carried out:

1. Utilizing the three consolidated indices of basic human need frustration, which were computed for each respondent from questionnaire data (Extremity of Basic Human Need Frustration, Unanimity of Basic Human Need Frustration, and Total Basic Human Need Frustration), and the five consolidated indices of psychological and physiological symptomatology developed for each respondent from questionnaire data (Extremity of Mental Health Symptoms, Mental Health, Extremity of Physical health Symptoms, and Unanimity of Physical Health Symptoms), Pearson product moment correlations were computed for each group across all respondents in that group. These results appear in Table 3.

Because three alternative indices of frustration and five alternative indices of mental health and health effects were developed, the data consist of 15 correlation coefficients in each of the eight cells. The 15 coefficients, however, are not mathematically independent because the alternative indices are merely that—alternative ways of indexing information derived from the same source.

2. Utilizing the three consolidated indices of basic human need frustration which were computed for each respondent from questionnaire data and the five consolidated indices of psychological and physiological symptomatology computed for each respondent, a set of Pearson product moment correlations was computed across all respondents in all groups. Results of this analysis appear at the end of Table 3.

Results of analysis pertinent to Prediction 2. For five of the eight community subgroups—Retired Women, Older Miners, Older Women, Younger Miners,

Table 3

Intercorrelation Between Consolidated Indices of Basic Human Need Frustration and Consolidated Indices of Mental Health and Health Symptoms Across Individual Subgroups and Across All Community Subgroups

Consolidated Indices of Basic Human Need Frustration	Consolidated Indices of Mental Health and Health				
	EMH*	UMH	MH	EPH	UPH
<i>Retired Miners</i>					
EBHNF ^a	.22	-.07	-.20	.30	-.07
UBHNF	-.05	.05	.07	.18	.03
TBHNF	.26	-.07	-.06	.39	-.08
<i>Retired Women</i>					
EBHNF	.14	.57*	.44	-.62	.38
UBHNF	-.06	.57**	.62**	.11	.36
TBHNF	.03	.53	.46	-.20	.45
<i>Older Miners</i>					
EBHNF	.12	.24	.19	.19	.26
UBHNF	-.26	.41	.29	-.32	.24
TBHNF	-.10	.54**	.47**	-.14	.32
<i>Older Women</i>					
EBHNF	.13	.13	.15	.12	-.17
UBHNF	.44*	.36*	.46**	.35	.05
TBHNF	.49**	.40*	.50**	.34	.04
<i>Younger Miners</i>					
EBHNF	.02	.75**	.68**	.31	.53*
UBHNF	.22	.56*	.54*	.28	.46
TBHNF	.14	.69**	.67*	.31	.56**
<i>Younger Women</i>					
EBHNF	.36	.21	.09	.82*	.31
UBHNF	.11	.14	.01	.41	.13
TBHNF	.14	.19	.04	.51	.20
<i>High School Men</i>					
EBHNF	.58	.93***	.94***	-.23	.23
UBHNF	.96***	.96***	.91**	.33	.04
TBHNF	.95**	.94***	.93***	.33	.13
<i>High School Women</i>					
EBHNF	.27	-.09	-.05	.18	.30
UBHNF	.41	.01	.09	.92***	.37
TBHNF	.38	-.08	-.02	.83**	.42
<i>All Subgroups Combined</i>					
EBHNF	.14	.30***	.28***	.08	.15*
UBHNF	.13	.36***	.38***	.10	.20**
TBHNF	.26**	.38***	.39***	.20*	.22**

Note: ^aAcronyms used in this table are as follows: EBHNF = Extremity of Basic Human Need Frustration; UBHNF = Unanimity of Basic Human Need Frustration; TBHNF = Total Basic Human Need Frustration; EMH = Extremity of Mental Health Symptoms; MH = Mental Health; EPH = Extremity of Physical Health Symptoms; UPH = Unanimity of Physical Health Symptoms. All correlations are based on individual subject scores on these dimensions.

* $p < .05$; ** $p < .01$; *** $p < .001$.

and High School Men—at least one significant correlation was found between indices of basic human need frustration and consolidated indices of mental health. In most cases this significant relationship was apparent across several of the dependent indices of basic human need frustration and across several of the dependent indices of mental health. This was to be expected in light of the common sources of the three indicators of basic human need frustration and for the three indicators of mental health. The findings provide substantial support for Prediction 2, and imply that there was a significant positive relationship between respondent self-reports of basic human need frustration and self-reports of mental health.

For four of the eight community subgroups—Older Miners, Younger Miners, Younger Women, and High School Women—at least one significant correlation was found between consolidated indices of basic human need frustration and consolidated indices of physical health. These findings provided support for Prediction 2, and implied a positive relationship between respondent self-reports of basic human need frustration and self-reports of physical health.

As can be seen in the last section of Table 3, when correlations are computed across all subgroups, seven of the nine correlations were significant between consolidated indices of need frustration and consolidated indices of mental health. For the community as a whole, four of six correlations were significant between consolidated indices of need frustration and consolidated indices of physical health. These results provide substantial additional support for Prediction 2. For the community as a whole, self-reports of basic human need frustration were moderately (avg. $r = .29$) and consistently related to self-reports of mental health symptoms. Self-reports of need frustrations were also consistently but less strongly related (avg. $r = .159$) to self-reports of physical symptoms. Data (not tabled) indicated that those respondents who reported mental health problems also tended to report physical health problems.

DISCUSSION

The research reported here constituted an initial effort to develop a model of the relation between community environment and individual functioning. The model developed guided an inquiry into a particular social system and the functioning of its members with the aim of identifying information about the social system that would provide a rational basis for allocating health and mental health resources there.

Discussion of Hypothesis 1

Results of the study did not support the first hypothesis, which predicted that the researchers, relying on the interviews and community observation, would be able to predict patterns of basic human need frustration reported by community

subgroups. The two groups that researchers estimated to have the least frustration—Older Miners and High School Women—were shown to be the most frustrated by frustration indicators derived from respondent self-reports. The discrepancy between researcher estimates and need frustration indicators derived from self-reports illustrated the difficulty in fathoming from without both the opportunities for need satisfaction among community subgroups and the priorities that different individuals placed on different aspects of their lives. While it is possible that outside experts will not be able to predict variations in basic human need frustration among subgroups no matter how much information they obtain, it seems more likely that, in our approach to community assessment, we overlooked an essential kind of information. Our interviews were directed toward evaluating the opportunities that each group had for need gratification, but, in retrospect, it is apparent that we did not get enough information about the opportunities that individuals did *not* have. Conceptually, a frustration ought to follow from a sense of something missed.

Clearly, judgments by researchers did not match basic human need frustration as assessed through respondent self-reports. If valid data on behavioral compensations (drinking, violence, etc.) could have been obtained, the pattern may have been different. With respect to community needs assessment, it seems safe to conclude that, when the criteria are self-reports of mental and physical health status, self-report assessments of need frustration will be useful predictors.

Discussion of Hypothesis 2

Substantial but not entirely uniform support was found for the prediction that lack of satisfaction of basic human needs results in correspondingly severe psychological and physiological consequences. Significant relationships were found between basic human need indices and consolidated indices of mental health for five of eight groups, and significant relationships were found between basic human need indices and consolidated indices of physical health for four of eight groups. The question arises, however, as to what explains the negative findings for several groups in correlating basic human need factor scores and physical and mental health factor scores.

Two essential dimensions of the data may be pertinent to potential error sources in these findings: (1) the set of basic human needs and assessment factors which were developed and imbedded in the questionnaire instrument; and (2) our inability to obtain direct data on behavioral compensation as a result of resource limitations.

The set of basic human needs used in this application of the model appears adequate for our purposes, but it is possible or even likely that some of the needs are not in fact *basic* and the resulting data would therefore have served to dilute the findings somewhat. For example, in evaluating Love and Affiliation, if this need is interpreted broadly as the presence of a special relationship between

persons, it may be the case that people can get along without this. In future empirical research with the model it may be possible to establish in fact a ranking or hierarchy among needs, whereas for the purposes of this study each need was treated as equally potent if frustrated. It also seems likely that achieving substantial satisfaction on one need may serve to offset even considerable frustration on another, but this question as well exceeded the scope of this current project.

The items which were developed to provide a derived need frustration score for each individual were considered pertinent to the subgroup and need in question. The intent was not to measure basic human need frustration, but to utilize the questionnaire as a structured interview that allowed respondents to make a self report related to these dimensions in order to assess the construct. It was not necessarily the case that the operationalizations chosen were the best possible. An alternative approach to that taken here would be to assess the opportunities available to community members to engage in the social practices and relationships through which basic human needs are most commonly met in this society (Table 1). Even this list is not exhaustive, however, and would not guarantee that the forms relevant to a given community were included, but such an approach would allow for greater uniformity than was achieved in this project in the dimensions sampled relevant to each need.

A second potential error source in the findings was that in this project it was not possible to obtain data regarding behavioral compensation related to basic human need frustration. A difficulty with all assessment through respondent self-reports is the likelihood of respondent distortion due to a social desirability factor. This factor operates in all mental health research, and it can be assumed that it was present to some degree in these data. Two particular dimensions of behavioral compensation included in the questionnaire were under the mental health section as "marital problems" and "drinking too much." No community subgroup reported significant symptoms in these categories. Evidence of these symptoms was ascertained during community interviews, and it was noted that bars and beer halls were common gathering places. Socialization around drinking was a primary social activity in this rural area. A greater amount of marital difficulty than these self-reports indicated probably exists there as well.

Ideally, it would be useful to utilize others' judgments of respondents' behavior as well, as a more extensive survey of possible behavioral dimension of need frustration in future need frustration studies. It might well be useful as well in future work with the conceptualization to develop a greater variety of mental health symptoms to be sampled.

All in all, it can be concluded that the procedures and findings elaborated here provide a basis for future research on basic human needs and their relationship to mental health and health. These findings provide a rational basis for the allocation of community resources in attempting to deal with mental and physical health problems.

It is not possible to present here the complete findings about patterns of basic

human need satisfaction for members of the eight subgroups in the community studied. A detailed picture of the life-cycle of persons involved in this community and occupation did emerge, and patterns of need frustration and satisfaction pointed to a variety of individual- and community-oriented interventions which could be carried out to address the needs and frustrations in question. Complete information on these findings and implications is available in the original report on the study. (see Lasater, Note 1).

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