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THE SYSTEMIC LIFE QUALITY MODEL: A BASIS FOR URBAN RENEWAL EVALUATION

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ABSTRACT. This paper develops, on the basis of explicit assumptions and axioms, a conceptual framework for observing the effectiveness of functioning of action systems, and, in particular of the human individual. The framework is used to construct a facet definition of human quality of life (QOL) which is claimed to be exclusive and exhaustive: The contents of the observational items it produces do not overlap and cover the entire QOL universe. A specification of two facets: the subsystem facet (personality, physical, social, cultural-value) and the functioning mode facet (expressive, adaptive, integrative, conservative) results in 16 content areas, each of which can be represented or covered by an observational item. The systemic QOL measuring instrument is examined with respect to its reliability and validity.

Structural hypotheses whose rationale is grounded in the elementary considerations that led to the systemic model of QOL are formulated, tested and are largely confirmed.

Finally, the systemic QOL model is applied to the evaluation of life quality and environmental conditions in a neighborhood designated as "distress neighborhood" within national urban renewal project.

1. INTRODUCTION

The Need for Life Quality Definition

The claim that a given neighborhood is a "distress neighborhood" needs to be justified through acceptable empirical assessment. This justification is essential both for ascertaining the claim itself, which is often accompanied by demands for public funds and assistance, as well as for conducting follow-up examinations for evaluating variations in the distress level.

The obligation to follow up variations in the distress level is particularly important in connection with attempts at alleviating distress through costly initiatives. Have investments brought about the desired improvement? Have recorded improvement in one area of concern not been accompanied by an unexpected deterioration in another area? How can neighborhood renewal and development activities be continuously guided for maximizing their efficacy? These are some of the

questions that may be answered by means of a reliable follow-up examination of neighborhood distress levels.

Hence a first step is to define distress.

Definition: Distress is an acutely low level of human life quality.

That is, by this definition, the concept of distress refers to the *observation-range* of another concept, *human life quality* (much as "cold" is to "temperature"). Hence the adoption of a clear and comprehensive definition for human life quality is a prerequisite for any evaluation of urban renewal project that has the wellbeing of human populations as its major focus of concern.

The purpose of this paper is twofold; first, it presents a comprehensive definition for human life quality, one that has been both theoretically rationalized and shown in numerous studies to be useful for conducting practical assessments; and second, to apply the power of that definition, and the ensuing life quality measurement scales, to the evaluation of life quality in a particular neighborhood that has been designated for renewal under the national "urban renewal project".

2. APPROACHES TO THE STUDY OF QUALITY OF LIFE

Several strategies for studying human life quality and for creating Quality of Life item-sets have been proposed in the literature of the past two decades. While a comprehensive survey of these works would be beyond the scope of the present paper, it would be useful to identify and briefly comment on the main approaches to the study of quality of life that have been advanced.

a. *The "Grass Root" Approach*

The researcher elicits from a large number of individual subjects (often students) lists of human experiences and phenomena that in their view best characterize *quality of life*. By aggregating and refining the contents of items thus obtained, a set of essential items is created. (See for example Dalkey *et al.*, 1972).

This pragmatic approach is marked by its focus on “real life” and represents an attempt to hold on to a tangible definitional basis. It may also reflect the democratic value “let the people decide” and an avoidance of elaborate theoretical contemplations (and perhaps a reaction to such scholarly exercises). The desire to hold on to the concrete is not, however, without its price. Based on the transient, culture-bound responses of individuals, this approach is atheoretical: It starts with no assumptions concerning human nature, human needs and makes no hypotheses concerning their structure. Yet, the process of aggregating items by their contents (which is part of this approach) requires guidelines that derive from *some* conceptual criteria. These criteria are typically unexplicated or involve ad-hoc considerations. Thus, they tend to reflect the momentary judgment of the researcher rather than a rationalized conceptual framework.

b. *The “Means to Quality of Life” Approach*

The researcher specifies (with or without subjects’ help) a set of means, resources or conditions that are assumed to contribute to, or be associated with human wellbeing. The assessment of quality of life consists then in inquiring to what extent these means are actually present in a given community or available to a given individual. The “objective” social indicators studies are a typical example of this approach. Some authors (for example, Milbrath and Sahr, 1975) have extended it to include subjectively perceived conditions of the social and physical environments.

In this approach the concept of quality of life itself remains undefined and intuitive. Moreover, even within the approach framework, no attempt has been made to classify and map out systematically the varieties of means, resources and conditions that contribute to human life quality. The actual selection of such means in any particular assessment exercise remains arbitrary and seems often restricted, biased or even totally uninformative as to their relevance to quality of life. In fact, the literature contains examples of items, for which it is not even clear whether the presence of the specified condition or its absence are to be taken as an indication of quality of life!

c. *The Direct Facet Definitional Approach*

Here the researcher defines, in effect, the concept of human life quality in terms of the universe of observational items that belong to that concept. Typically, individuals whose life quality is to be assessed are asked to respond to questions concerning their feelings and perceptions, in a number of areas. To the extent that they claim to be happier or more satisfied with aspects of these areas, their life quality is recorded as higher. Andrews and Withey, 1976; Campbell, Converse and Rodgers, 1976; Levy and Guttman, 1975, are examples of this approach. Typical to this approach is the tacit (e.g. Andrews and Withery) or explicit (e.g. Levy and Guttman) use of *facets* by which item domain contents are classified (Guttman, 1957; Shye, 1978); for example the *attitude modality facet* (cognitive vs. affective; see also Andrews and McKennell, 1980); or the *life area facet* (Job, family, public service and more; Levy and Guttman, 1975). The facets, in effect, are designed to provide a structural rationale for the formulation of items. In this respect, the direct facet definitional approach differs from the grass root approach.

The value of the direct approach is clear: Quality of life is defined in terms of items conceptual components that are specified to form its meaning. By obtaining the responses from the individuals concerned, one does not content oneself with inferior subjective data, but rather one observes directly — perhaps as directly as possible — the studied phenomenon itself. Moreover, the paradoxical task of establishing the validity of quality of life indicators by assessing their relationship to an unobservable concept is avoided. In these respects the direct facet-definitional approach differs from the “means to quality of life” approach.

Nevertheless, quality of life studies based on the direct facet-definitional approach have suffered from lack of conceptual rationale for the selection of *facets* and facet *elements*. For example, consider the life-area facet. What areas should be used to cover or sample human life sufficiently well for the assessment of life quality to be balanced and reliable? Is, for example, one's married life a separate life area, or should it be included in “family”? How about raising children (Dalkey, 1972); or government treatment of security issues (Levy and Guttman,

1975), should they be considered relevant life areas along with one's job? Is one's health a life area in the same sense that one's housing is? To the best of our knowledge, no serious attempt has been made to provide a rationale for the specification of facet elements, which typically seem to represent the cultural, situational and personal biases of their authors (one researcher who, by his own procedure, reached "satisfaction with food" as a factor relevant to life quality, excluded it after the fact, because, in his opinion, food presented no problem in his society!) And thus, although the direct facet-definitional approach is more explicit than the other approaches mentioned, the actual item-sets it yields turn out in practice to be just as arbitrary.

3. THE SYSTEMIC QUALITY OF LIFE APPROACH

The approach to the conceptualization and assessment of life quality to be presented here is based on past scholarly works on action systems and theories concerning human condition. It is formulated in terms of facets, and is most often applied by recording subjects' self report, and hence overlaps with the direct facet definitional approach described above. It differs however from that approach in that it starts with explicit assumptions concerning the nature of human individual life, defining it as a particular case of *living action systems*. These assumptions and definitions, form the basis for the selection of elementary binary facets whose elements are clearly exclusive and exhaustive. These facets permit the systematic determination of differentiated life quality components, formulated so as to represent *functioning effectiveness* of the individual system. The role of the assessors is then to evaluate as accurately as they can, the systemic functioning effectiveness of the individuals concerned. If each individual assesses his or her own life quality by this scheme, the assessments are "direct"; this is indeed the case in most applications.

The systemic life quality model was introduced in (Shye, 1975; 1976); the consistency of its structure and reliability of the ensuing scales were demonstrated in (Shye, 1979). The model has been applied widely to the evaluation of environmental projects (proposed nuclear power plant; Shye 1976; 1982); of environmental policy (high rise building; Shye, 1976); in urban renewal projects (Shye *et al.*, 1980;

Joelson *et al.* 1982); the study of closed institutions for juvenile delinquents (Wolins, *et al.*, 1980; Wolins and Wozner 1981) as well as in other contexts.

Points of Departure for the Systemic Life Quality Model: Preliminary Remarks

Several assumptions and expectations have guided our search for a comprehensive faceted definition for human life quality. It may be useful to present them explicitly.

(1) *The nature of definitions.* We take it for granted that “definitions are never correct (or incorrect)” (Guttman, 1977). The merit of a proposed definition is determined by two criteria

(i) (a technical criterion). Its definitional reliability (clarity); that is, qualified individuals would understand by it similar universes of contents (similar universes of observational items);

(ii) (substantive criterion). Its power (believed or proved) for discovering regularities — and ultimately laws — in data collected according to the definition (Shye, 1978).

For example, a reasonable expectation from a Quality of Life (QOL) definitional framework is that in general, non-artificial populations (Shye, 1978), the correlations between derivable QOL items be non-negative. *In fact, we hypothesize this to be the case for the definitional framework to be proposed here.* The rationale for this hypothesis is that the definition is to represent a coherent conceptual entity so that even though its component are analytically distinct, statistically an increase in any one component would not be accompanied by a decrease in any of the others.

Further laws may concern finer aspects of the internal structure of QOL than the one just discussed, or may involve manipulable aspects of the socio-physical environment. These points are further elaborated upon below.

(2) *Multidimensionality of QOL.* We anticipate a QOL content universe to be multidimensional in its empirical as well as definitional structure, requiring a partial order scalogram, rather than a simple scale, for its assessment.

(3) *QOL as an attribute of individuals.* The quality of individual life, which is the focus of this study, is attributable to individual human beings. Its assessment therefore is based definitionally on observations of individuals. In this respect it is not different from any other individual traits such as attitudes, achievements, and so on. QOL in a given community, therefore, is a simple function of the QOL of the individuals who make it up. This individual QOL is to be distinguished from the quality of community life, the quality of organizational life, etc., which refer to the corresponding bodies *as such*. (Organizational QOL has been defined in a manner analogous to the definition to be presented here, Shye and Wozner, 1978).

(4) *QOL versus environmental quality.* The terms “quality of life” and “quality of the environment” have often been confused in the literature. We have defined quality of the environment (QOE) to mean “the extent to which the physical environment (or aspects thereof) promotes the QOL of affected individuals” having, of course, negative as well as positive parts to its range (Shye, 1976). Thus, QOE is not only a distinct notion from that of QOL, but, moreover requires a different procedure for its assessment: Whereas QOL is to be assessed by observing the state of affairs in the outlined domain, QOE would be assessed through evaluating the *effects* of the physical environment (or aspects thereof) — and differentiating them from the effects of other circumstances — on QOL. Hence while QOL data are most directly obtainable from the individuals concerned, QOE data should derive from a variety of sources in the attempt to gather evidence concerning possible causal relationships. In such efforts at establishing relationships between environmental conditions and QOL, a prominent role must be assigned to experts in the relevant human and physical sciences, as well as to the data analyst.

(5) *The role of indirect (“objective”) QOL indicators.* Concerning the role of “objective” environmental and social indicators: These indicators must be properly regarded as but indicators of the physical or social conditions prevailing in the community. As such, they do not constitute part of QOL definition. It is no surprise, therefore, that objective and subjective indicators are not found to be consistently correlated (Schneider, 1975; Campbell *et al.*, 1976; Andrews and Withey, 1976;

Inglehart, 1977). Some particularly well conceived objective indicators may indeed, under specific conditions, be correlated with QOL — or aspects thereof. However, the practice of using these indirect variables as indicators of QOL, (which is usually conducted without reference to an explicit definition of QOL itself, and *a fortiori* without having established relationships between these indicators and QOL) seems to us inadequate and capable of leading to errors in the planning and implementation of social policy.

(6) *Cultural invariance of QOL definition.* The basic terms used in the QOL definition should be culturally invariant: In fact, they should be equally applicable to all human beings regardless of any background characteristics. This is so even if assessment techniques may vary to suit the constraints or opportunities of the particular assessment situation. (See also reference to facet analysis and cultural invariance in Levy (1976) and in Shye (1978b).

(7) *The systemic approach.* Many writers have expressed the conviction that QOL should be regarded as a *system* and, in particular, as a living system. Smith (1978), for example, advocates this strategy for the construction of socio-cultural indicators. Indeed, the living system approach seems essential if notions such as order and growth are to share a common conceptual roof, and if components of QOL are to be studied with respect to lawfulness in their pattern of interactions. However, in spite of important efforts by Buckley (1967), Bauer (1966) and others it seems that the insistence on causal feedback models is at least premature. Fortunately, this is not even necessary for the inclusion of “purposiveness” and other features of living systems. Rather, such living system notions can be taken as elementary components of the studied system. What we will insist upon, instead, is the conceptual explication of the system components, rationalizing their sufficiency at any given level of generality, and of their internal logic.

(8) *Theory vs. pragmatism?* QOL studies can be truly useful only if they contribute to the establishment of lawfulness in well defined sets of empirical observations. Thus, we do not seek fancy conceptual frameworks unless they are for observable data, nor techniques for manipu-

lating data unless they promise the discovery of stable patterns and eventually laws. A theory, then, is "an hypothesis of a correspondence between a definitional system for a universe of observations and an aspect of the empirical structure of those observations, together with a rationale for such an hypothesis" as Guttman suggests (Gratch, 1973; Shye, 1978) and as such, does not stand in opposition to pragmatism. In fact, searching for and establishing a theory (as defined here) is the only way open to the scientist to be truly "pragmatic." Unfortunately many attempts to apply system theoretical notions to social and behavioral problems (although often intellectually rather stimulating) lack in definitional rigor — they do not define reliably an intended universe of empirical observations. Hence, they cannot lead to the discovery of empirical laws and therefore hardly qualify as "theories" in the sense adopted here.

A typical comment on this problem was voiced by Laumann and Pappi (1976) towards Parson's work on the social system:

Parsons does emphasize the fact that his scheme is analytic and abstract by design and, consequently, that a given empirical phenomenon cannot be equated on a strict one-to-one basis to his analytic scheme . . . To maintain this distinction between the analytic and the real, however, is very difficult in practice, especially since Parsons has provided so few operational rules to guide the empirical investigator in avoiding these very pitfalls. It is precisely this difficulty of building operational bridges from Parsons' highly abstract formulations to the real world that has led so many empirically oriented investigators simply to abandon attempts to do anything with the scheme, despite its obvious attractions as one of the few systematically coherent, comprehensive approaches to the study of system differentiation and integration. (Laumann and Pappi, 1976).

Thus, Parsons' work, despite its great influence on sociological thinking, has not led to a system of unequivocal hypotheses which would stand acceptable empirical testing. But, in our view, the difficulty does not stem from Parsons' theory being *abstract and analytic*. On the contrary, this is exactly what we would expect from a "coherent, comprehensive" approach. Rather, the difficulty lies in the degree of clarity and reliability of the proposed definition, and in their fit to observable entities. The task of sharpening such definitions, and of rendering them more suitable for empirical observations can be enhanced by a careful facet analysis of the studied contents. Here we shall conduct such an analysis for the contents of human life quality, viewed as a systemic

notion; in fact, as a special case of living system in general. That the axiomatic approach adopted here leads us to a scheme whose general outline resembles Parsons' (1953; 1978) phase scheme is a tribute to the intuitive power of that great scholar.

4. A FACETED MODEL FOR GENERAL LIVING SYSTEMS

The purpose of this section is to develop a definitional framework for the universe of functioning of any living system, and to anchor it in a logically closed faceted model. This will permit us to define "quality of life" of such systems and to formulate hypotheses concerning its structure. (The next section will apply the general notions developed here to the particular cases of the human condition and the human individual.) To do this we must first state our assumptions axiomatically:

Axiom 1: An event in relation to a given action system has two distinct modalities:

- (1) The *emergence* modality, and
- (2) the *actualization* modality;

both of which are undefined elementary concepts. (Intuitively, however, emergence indicates the birth of the event while actualization indicates its manifestation.)

Axiom 2: With respect to each event modality, it may be determined whether it is located *inside* or *outside* the system.

Note that the axioms do *not* imply that every event is "split" or is twofold. Rather, that a single event when examined *from the perspective of a particular action system* has two "faces", each of which may be independently localized inside or outside the system. The event itself remains one. The two axioms imply the following *a priori* classification of events, in relation to a given system:

1. events emerging *inside*, and actualized *outside*, the given system;
2. events both emerging *outside*, and actualized *outside*, the given system;
3. events both emerging *inside*, and actualized *inside*, the given system;

4. events emerging *outside*, and actualized *inside*, the given system.
Let us consider the meaning of each class of events:

1. *Events Emerging Inside and Actualized Outside a Given System*

Events of this type constitute the universe of the living system's activities by means of which it exercises its power and affects its environment.

From the system's viewpoint, these events are an expression of internal forces and pressures directed toward the creation of an external reality which reflects in one way or another the system's own characteristics. The manner in which the system relates to these events will be termed the *expressive mode*.

The system's functioning with respect to its expressive mode is more *effective* inasmuch as the outside-system actualization of an event is more similar to its inside-system occurrence. (Illustrations: Parents are generally pleased to find that their children are similar to them in looks and in other traits; a work of art is more pertinent or "convincing" if it faithfully reflects existential experiences of society.)

2. *Events Both Emerging Outside and Actualized Outside a Given System*

These are simply all external events (including conditions, occurrences, and entities) in the system's environment. Of special interest are events with regard to which the system is open, that is, maintains an inter-relationship with them (exchange of "matter" or "energy" of any type).

From the system's viewpoint these include the environmental conditions — constraints and opportunities — with which the system must continually negotiate in order to maintain mutual adjustment. The adjustments are effected by the system's adaptation to, and exploitation of, its environment. The manner in which the system relates to such events will be termed the *adaptive mode*.

The system's functioning with respect to the adaptive mode is more *effective* inasmuch as the relations between it and its environment are differential, complementary, or compensatory. (Illustrations; dry air is more congenial than humid air for perspiration, which is needed for

cooling off the body — thus the difference in humidity facilitates effective adjustment; a country which has a manpower shortage adapts better if it interrelates with a country which has a surplus of manpower and can thus satisfy its manpower needs.)

It is important to distinguish between the system's discharge of energy-material that takes place in connection with the adaptive mode (a mode which includes energy-material *reception* as well) and that which takes place in connection with the expressive mode. Effective adaptivity contributes to the maintenance and growth of the system itself, but from the system's viewpoint the nature of the material that is discharged in connection with adaptivity is of no essential significance; an economic system of a country may change from the production of textiles to the production of, say, computers in the framework of adapting to the world market; a municipal system will discharge refuse in the framework of its activities, generally without feeling that the discharge represents its essence or its uniqueness as a city. On the other hand, effective expressivity reflects something of the internal essence of the system. For example, a museum, or historic site, is an external expression of internal images of a society, and these are often maintained despite probable economic burden, in other words, despite its likelihood of causing damage to the adaptive functioning of the society. There are, of course, activities that contribute both to effective adaptivity and effective expressivity: a person who is building a house is thereby meeting his adaptive needs (by ensuring a roof over his head); but in designing the house he is likely to give external expression to internal aspects of his personality. (But here too, there may be conflicts such as between convenience [adaptivity] and desired appearance [expressivity]). The following observation should help distinguish between discharge that takes place in the context of adaptivity and that which takes place in the context of expressivity: in the former case the amount of "energy" or "material" decreases in the system as a result of the discharge; in the latter case the system loses little in the discharge since the discharge is more in the nature of "information".

3. *Events Both Emerging and Actualized Inside a Given System*

These are the universe of internal events (including conditions, occur-

rences, members, and relations) which take place fully within the system. To an outside observer, the internal components and events appear organized in mutual interrelationships and compatibilities which have a role in the system's activity.

From the system's viewpoint, such events are subject to ongoing internal adjustments which take place by compensatory or complementary processes. The manner in which the system relates to such events we shall term the *integrative mode*.

The system's functioning in the integrative mode is more *effective* inasmuch as the relations among the various components of the system are mutually complementary or compensatory. (Illustrations: the tasks assigned to the various departments of an industrial plant should be differential and complementary to each other; overlapping of duties may result in conflicts. If, as a consequence of the penetration of a virus into a live body, the suitable antibodies multiply sufficiently, they will restore the body's balance and thus maintain its health and wholesomeness. The antibody differs from the virus in an essential way and compensates for the existence of the virus.)

4. *Events Emerging Outside and Actualized Inside a Given System*

Actualizations within the system of events that emerge outside it are all those relatively permanent, inherent characteristics of the system which were granted to it from outside at the time of its creation or formation.

The birth of a living system may be regarded as a consequence (expression) of an antecedent living system that has generated it and endowed it with its basic characteristics, or its "structure."

From the system's viewpoint, such events constitute a fundamental aspect of its identity (and it is precisely for this reason that they are sometimes overlooked). The manner in which the system relates to such events will be termed the *conservative mode*.

The system's functioning with respect to the conservative mode is more *effective* inasmuch as the system adheres to the various aspects of its structure, namely, inasmuch as it maintains similarity over time with respect to its structural features. The extent of the said "adherence" (and hence of the effectiveness of conservativity) is to be

considered higher inasmuch as it is maintained with respect to a more complex and refined structure (see below), since similarity is greater inasmuch as it relates to more components and more structural relationships. (Illustrations: A state's constitution, upon its adoption, is an event of this type; the ongoing commitment of the state to its constitution is an effective conservative functioning. This function will remain effective even if the state's commitment to its constitution changes gradually and relates only to abstract aspects of the constitution, giving it a new interpretation. Various religions allow for renewed interpretations and new emphases of their original codes in an attempt to adhere and preserve the spirit and implications [which are finer aspects] of the same code. Under certain circumstances, excessive adherence to structural characteristics may harm other functions of the system. Thus, for example, the human body's rejection of a transplanted organ is an example of functioning in the conservative mode with respect to structural-genetic traits of the individual.)

It is perhaps worth mentioning what is *not* included in the functioning of the conservative mode: In spite of its definition in terms of events which emerge outside the system and are actualized inside it, we of course do not mean, for example, the intake of food by a living body, or the admission of students by a university. These events are part of the functioning in the adaptive mode, since they involve selections and mutual adjustments between the system and environmental factors. True, external factors are liable to turn into internal factors; but the essence of the event is mutual adjustment and not adoption of patterns stemming from outside. (However, in participating in a ritual dinner there are aspects of functioning in the conservative mode with respect to the system of cultural values in addition to possible functioning in the adaptive mode, namely, the satisfaction of hunger.)

The four functioning modes of an action system are summarized in Table I.

Figure 1 is a spatial representation of the four functioning modes: Expressivity, adaptivity, integrativity and conservativity. This representation, analogous to the one envisaged by Parsons (1953) is shown here to be the outcome of the double classification of the event-modality-localities. Figure 1 not only summarizes the above event classification

TABLE I
The four functioning modes of an action system

Functioning mode	In this mode the system relates to events that:	Functioning in this mode is more effective inasmuch as:
Expressive	emerge inside the system and are actualized outside the system	the system characteristics are reflected in its activities (i.e., the system's external expressions resemble its characteristics)
Adaptive	both emerge and are actualized outside the system	there are mutual complementations (compensatory relations) between the system and its environment
Integrative	both emerge and are actualized inside the system	there are mutual complementations among the system members
Conservative	emerge outside the system and are actualized inside the system	the system's structural characteristics are stable over time

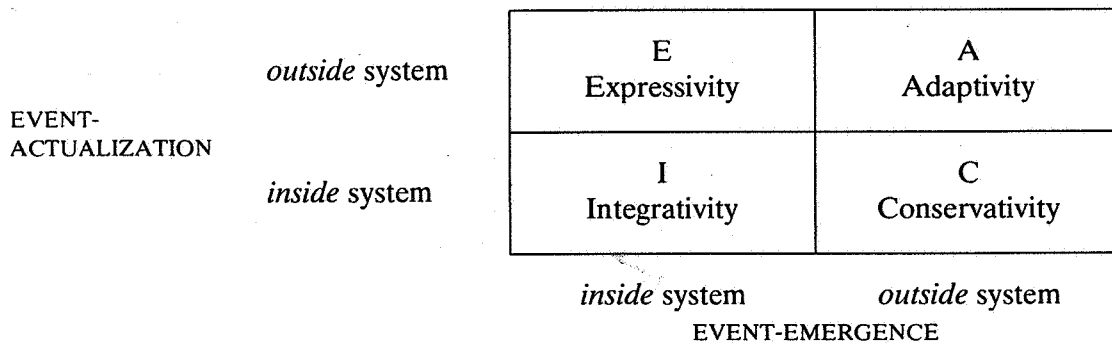


Fig. 1. The relative orientation of the four functioning modes by the double classification of system-related events used to define them.

but also provides a basis for an actual hypothesis: In a suitable multivariate data analysis, such as Multidimensional Scaling (MDS), *observed variables of the corresponding functioning mode contents would be found empirically to have the shown spatial relationships.*

A framework for observations for the systemic life quality may be presented by means of a mapping sentence which specifies the essential facets as well as the range of observations to be recorded:

MAPPING SENTENCE 1a

A conceptual framework for the universe of observational items of systemic life quality

The extent to which action system (x) relates *effectively* to events that

<i>Facet A</i>		<i>Facet B</i>
<i>Locus of Emergence</i>		<i>Locus of actualization</i>
emerge $\left(\begin{array}{c} a1 \text{ inside} \\ a2 \text{ outside} \end{array} \right)$	the system and are actualized	$\left(\begin{array}{c} b1 \text{ inside} \\ b2 \text{ outside} \end{array} \right)$ the
system \rightarrow	$\left(\begin{array}{c} \text{high} \\ \text{to} \\ \text{low} \end{array} \right)$	effectiveness,

where effectiveness is recorded as greater the greater the *similarity* between the system and events, whenever two *like* elements of facets A and B are considered; and is recorded as greater the greater the *complementarity* between the system and events, whenever two unlike elements of facets A and B are considered (see also third column in Table I).

Or, in terms of the functioning modes, the mapping sentence becomes simply:

MAPPING SENTENCE 1b

A conceptual framework for the universe of observation items of system life quality in terms of functioning modes

The extent to which action system (x) functions *effectively* in the

<i>Mode</i>		
$\left(\begin{array}{c} \text{Expressive} \\ \text{Adaptive} \\ \text{Integrative} \\ \text{Conservative} \end{array} \right)$	mode \rightarrow	$\left(\begin{array}{c} \text{high} \\ \text{to} \\ \text{low} \end{array} \right)$ effectiveness,

where functioning effectiveness is recorded as noted above and in Table I.

The Functioning Mode as an Action Subsystem

Each of the functioning modes of a system may be regarded as a system in itself, since it is a defined collection of behaviors — i.e., a system's

relationships to events of the same type — which maintain interrelationships among themselves. This possibility (namely, that action systems may be iteratively composed of subsystems) has been suggested in the context of social systems for Parsons' AGIL scheme by Turner (1974) and by Parsons himself (personal communication, 1972). Each functioning mode, viewed as a system, has, as such, its own four functioning modes of expressivity, adaptivity, integrativity, and conservativity with which it relates to events of the various types. Each of these modes, in turn, may be regarded as an action system in its own right. As an illustration, consider the sub-subsystem of the expressive mode of the subsystem of conservative mode of the original system. This sub-subsystem includes possible specific mutations and developments in the subsystem of structure conservation. These, in turn, will be manifested in changes in the original system's structure. Moreover, effective functioning of the said conservative mode requires a certain amount and a certain type of such developments, and (if such changes do not adversely affect the effectiveness of the other functioning-mode sub-subsystems) they may refine and improve the original system's structure. Successful expressive activity in the conservative mode subsystem would actualize potential variations in the original system's structure which are inherent in the structure of the conservative-mode subsystem. For example, according to the theory of evolution, changes in the genetic code of an individual of a certain species (whether by accidental mutation or by means of the bisexual reproduction mechanism) are capable, over time, of effecting a "change" in that species; that is, the structure of individuals evolving from the new code may replace the previous structure. And thus, while the genetic code determines the structure of members of a species, *changes* in the genetic code occur within the framework of the genetic code itself and its laws (which determines which mutations are possible and which are not). An additional illustration: The Constitution of the United States determines the governing structure of that country; but there are also principles and procedures which determine how it may be possible to change and amend the constitution itself, and thus effect developments in that same governing structure.

From all of the above, the meaning of the concept "system structure" becomes clear: it is a collection of basic traits of a system, which determine which relationships and events are possible and which are

not. A system structure is more refined inasmuch as it relates to a greater number and to more distinct events and relationships. In the process of systemic "development" (i.e. a chain of systems each of which produces its successor), there is often a growing refinement in the system structures since the specific expressions of the conservative-mode subsystem bring about only slight, and rather delicate, changes in aspects of the system structure.

Incidentally, from the above discussion it is clear that the effective functioning of a living system in its conservative mode does not necessarily imply resistance to change; rather, it allows, and even requires, changes and developments in aspects of the structural patterns adopted by the system.

5. LIFE QUALITY OF HUMAN INDIVIDUALS

In the preceding section a conceptual framework for the life quality of any living system was developed and its implications were discussed. In this section the generic skeletal notions of that framework will be applied to a specific living system —the individual human being. This will involve the assignments of known concepts from human experience to those generic ones, and the justification of such assignments. Next, by using the faceted definition for the universe of items of systemic life quality, we shall construct a set of life quality items for human individuals. Finally, the conceptual structures of the preceding section will be applied to the system of the human individual to assist us in formulating structural hypotheses concerning human life quality.

The General Human System (GHS)

The self awareness of human beings (including their awareness of belonging to the human species) leads each human individual to regard himself as an instance or a reflection of idealized entity that may be called the *General Human System (GHS)*. Viewed as a living system this idealized entity refers to the very existence of human individuals in a society of similar individuals.

The meaning of human existence in society is derived from a system of values that (are taken to) exist outside the General Human System

and are to be realized in that system. Indeed, fundamental values, moral codes, religious faiths and ideologies typically anchor their validity in external forces that, while independent of human existence, demand to be embodied in it. Hence the *value system* adopted by a reference-society constitutes the set of O/I occurrences of the General Human System; that is, the System relates to them in a *conservative mode*.

The embodiment of the "General Human System" is, of course, in the personalities of specific human individuals. Thus, the emergence of particular *personalities* constitutes, from viewpoint of the general human system, I/O occurrences; that is, the System relates to them in an *expressive mode*.

Indirectly, then, values that are incorporated into the General Human System, are expressed in the personalities of particular individuals. The path is indirect because it goes through a system of physical adjustments and a system of social (including interpersonal) adjustments:

The *physical-biological* reality of human beings requires them to enter into negotiative-type interactions with the physical environment. Because physical interactions are external — both in their existence and in their realization — to the idealized General Human System they constitute O/O occurrences and the System relates to them in the *adaptive mode*.

Social and interpersonal adjustments are also negotiative, but they take place entirely *within* the General Human System. Hence they constitute I/I occurrences and the System relates to them in the *integrative mode*.

By identifying himself with the General Human System (an attitude which is equivalent to the human self awareness; or, from the scientist's point of view, to playing both the observer and the observed) the human individual assumes the four functioning modes of the General Human System. Thus, every living individual may be regarded as a *cultural being* in whom endowed values are embodied; as a *personality* which manifests in specific behaviors general human potentials; as a *physical body* occupying a region in space and time; and as a *social being* that enters into interactions with other individuals and groups.

Following the conceptual framework for living systems, effective functioning in these four modes of the General Human System would

be attained in an individual to the extent that: a set of values is adhered to (conservativity); personality is manifested (expressivity), physical environment is profitably interacted with (adaptivity), social (and societal) relations are maintained harmonious (integrativity).

An initial mapping sentence for human life quality would be:

MAPPING SENTENCE 2a

A one-faceted definition of human life quality

The extent to which Human Individual (p) functions effectively in the

Facet A: Mode of Functioning

$$\left(\begin{array}{l} 1. \text{ expressive} \\ 2. \text{ adaptive} \\ 3. \text{ integrative} \\ 4. \text{ conservative} \end{array} \right) \text{ mode of the General Human System} \rightarrow$$

$$\left(\begin{array}{l} \text{high} \\ \text{to} \\ \text{low} \end{array} \right) \text{ effectiveness,}$$

where, again, it is the unique self awareness feature of human beings which permits the seeming incoherence of assigning quality levels to one system (p, the human individual), according to how it functions in the mode of "another" system (the General Human System). Or, differently stated, this seeming incoherence is justified because of the experienced identification of individual human systems with the General Human System.

The above mapping sentence can be rephrased thus:

MAPPING SENTENCE 2b

The extent to which human individual (p) functions effectively in the

Facet A: Subsystem of Functioning

$$\left(\begin{array}{l} 1. \text{ personality} \\ 2. \text{ physical} \\ 3. \text{ social} \\ 4. \text{ cultural} \end{array} \right) \text{ subsystem} \rightarrow \left(\begin{array}{l} \text{high} \\ \text{to} \\ \text{low} \end{array} \right) \text{ effectiveness,}$$

where the four subsystems are defined to be the corresponding functioning modes of the General Human System, as viewed from the perspective of a particular human individual.

In both mapping sentences 2a and 2b the key concept is that of effectiveness of functioning, which lends its meaning to the range of the observational items. As before (Mapping sentences 1a, 1b) effectiveness is to be understood differentially as represented by *similarity* in the cases of cultural-valuative and personality functioning; and as represented by *complementarity* in the cases of the social and physical functioning.

Subsystemic Structures

Each of the four subsystems is a living system in its own right, having its own expressive, adaptive, integrative and conservative mode. A mapping sentence for human life quality, incorporating both the four subsystems and the four subsystemic modes can be written as follows:

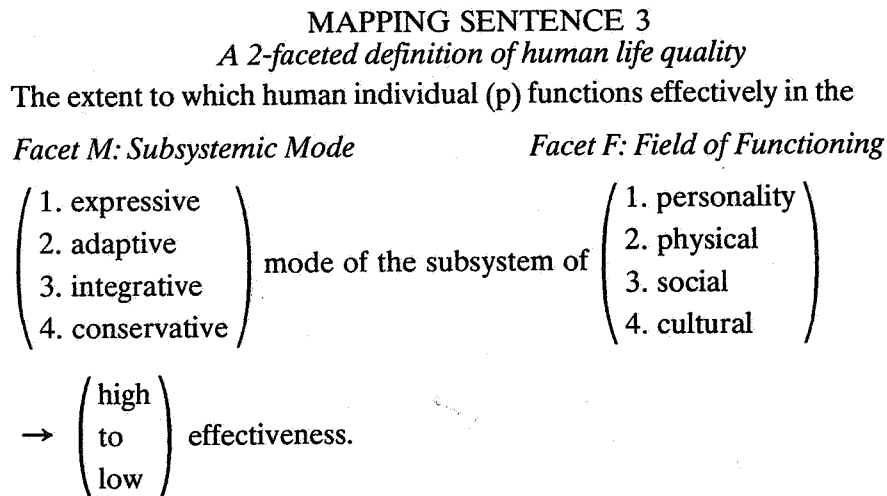


Table II explicates the meaning of each of the $4 \times 4 = 16$ structuples (a selection of one element from each of the two facets) of this mapping sentence. These explications serve to form suitable observational items, such as questionnaire items.

The Design of Empirical Observations and Technical Results Concerning the Measuring Instrument

To test for structural regularities in empirical data on individual life quality as defined, and to construct multidimensional scalograms for the

TABLE II
The four modes of the four subsystems of individual human functioning: explications

Subsystem and Mode	Occurrences related to	Criterion for effective functioning
<i>Personality subsystem</i>		
expressive mode	the emergence of specific behaviors (actions, perceptions, emotions, beliefs), peculiar to the individual	behaviors that faithfully reflect ('similar to') the personality system. Such concerted behaviors can become viable and lead to growth (self realization or the evolution, over time, of structural differentiation).
adaptive mode	interactional process between the personality and its environment (incl. the individual's other three subsystems as well as environment external to the individual)	compatibility based on mutual compensations and complementations between personality and its environment. These include the availability of mental-recreational resources, accepting and being accepted by others, as well as establishing and maintaining agreement between the personality and the individual's own social, cultural and physical fields.
integrative mode	interactions among personality characteristics	compatibility based on mutual complementation, agreement and balance among individual's personality traits. This includes peace of mind, and those aspects of mental health that can be defined in terms of balance, or lack of conflict, among personality components.
conservative mode	the basic structure of (set of relationships among) personality components	adherence to a personality structure; maintaining the degree of stability and continuity needed to affirm personal identity. These include fundamental sense of personal confidence and those aspects of mental health that can be defined in terms of structural stability and identity.
<i>Physical subsystem</i>		
expressive mode	exerting physical energy upon the subsystem's environment	physical exertions that faithfully reflect the subsystem's capability and potential. If well coordinated they can lead to growth, physical development and structural differentiation in the individual's physique. Physical exertions, and growth, can be manifested in the other three subsystems as well as in the environment external to the individual

Table II (Continued)

Subsystem and Mode	Occurrences related to	Criterion for effective functioning
adaptive mode	<p>interactional processes between the individual's body (bodily needs) and the environment. (The "environment" of the individual's physical existence includes the other three subsystems as well as the environment external to the individual)</p>	<p>compatibility based on mutual compensations. These include the availability of physical resources for the individual (air, food, shelter, energy) as well as the individual's body adjustment to uncontrollable conditions.</p>
integrative mode	<p>interactions among the individual's various physical characteristics</p>	<p>compatibility based on complementation, agreement and balance among individual physical traits. This includes feeling physically well and those aspects of physical health that can be defined in terms of balance, or lack of conflict, among the various bodily parts and processes.</p>
conservative mode	<p>the basic physical constitution</p>	<p>continuity of physical structure including fundamental sense of bodily confidence, freedom from violence and accidents, and those aspects of physical health that can be defined in terms of genetic regularity and irrevocable bodily damage.</p>
<i>Social subsystem</i> expressive mode	<p>the exertion of social influence, including interpersonal influence and societal power (political activity)</p>	<p>social activities that faithfully reflect the inner characteristics of the social subsystem (the individual's social base). If well coordinated they can lead to growth in the sphere of social relations and (if growth is experienced by many in the community) to societal evolution and structural differentiation</p>
adaptive mode	<p>interactional processes between the individual as a carrier of social roles, and the environment (incl. the other three subsystems)</p>	<p>compatibility based on mutual complementation and need fulfillment between the individual's social roles and all aspects of their environment. This includes valuable and profitable relations that stem from roles such as family member, employee or employer, citizen, consumer of goods and services. Maintenance of good relations with all social institutions.</p>

Table II (Continued)

Subsystem and Mode	Occurrences related to	Criterion for effective functioning
integrative mode	interactions among the individual's various social roles	compatibility based on mutual complementation, agreement and balance among the individual's social roles. This includes a sense of being a socially wholesome. Those aspects of social affinity (nonalienation) including interpersonal intimacy, that can be defined in terms of balance and agreement (no conflict) among social roles, belong here.
conservative mode	social structure of the community of the individual	stability in the social structure, experienced as a fundamental sense of belonging and trust, including those aspects of social affinity (non-alienation) that can be defined in terms of social identity.
<i>Cultural (value) subsystem</i>		
expressive mode	the assertion and upholding of values, the exertion of moral influence	'convincing' activities, faithfully reflecting value commitments, ideology or religion. If well coordinated they can lead to growth and refinement in the sphere of values and (if growth is shared by many in the community) to evolution and differentiation in the structure of value commitments.
adaptive mode	interactional processes between the individual as a carrier of values, and the environment (incl. the other three subsystems)	compatibility based on mutual complementation between values held by the individual and all aspects of their environment. The environment includes, in particular, values held by others as well as external social and physical conditions. The individual's other three subsystems are also part of his value-environment.
integrative mode	interactions among the values held by the individuals	compatibility based on mutual complementation, agreement and balance among the individual's value commitments. This includes a sense of being morally and culturally wholesome and those aspects of moral integrity that can be defined in terms of balance among values.
conservative mode	the value structure of the community of the individual	stability in the value structure experienced as a fundamental sense of commitment to a set of values or a culture. This defines the individual cultural identity.

assessment of QOL, it is necessary to conduct appropriate observations on the effectiveness of individual's functionings in the various modes. Who is an expert concerning a particular individual's life quality? There may be none, for the individual is as complex a living system as any. Still, the people closest to the individual are more knowledgeable in this regard than others. In the case of adults, the individual himself may be the best assessor, although adults may vary considerably in their self knowledge and hence in their ability to assess their life quality at any given time. Nevertheless, if the contents of the functioning modes do correspond to fundamental relations experienced by the individual, as we believe, then there is a fair chance that adults' responses to properly phrased questionnaire items with ordered ranges be sufficiently reliable to produce meaningful structural regularities.

In a detailed technical report (Shye, 1979), four sets of 16 questionnaire items each were created. Within each set every item corresponded to one subsystemic mode. Two of the sets (sets I and III) were made up of *sampling items*, that is, each item referred to a part, or to an example from the contents of the intended mode. The two other sets (II and IV) were made up of *covering items*, whose wording closely adhered to that of the mapping sentence defining individual QOL. Sets I and II were presented to one sample and sets III and IV to another sample, each of over 500 adults, randomly selected from the population of permanent residents of the four major urban centers in Israel (Jerusalem, Tel Aviv, Haifa and Beer-Sheba).

The data obtained from the two samples were analyzed in order to (1) examine their multivariate structure and test the structural hypotheses concerning the interrelationships among subsystems of human life. These were expected to confirm the internal validity of the systemic life quality definition, and demonstrate its relevance to identifying lawfulness in empirical observations; and (2) compare life quality assessments obtained from covering item sets with those obtained from sampling item sets in order to establish reliability of the latter.

The Structure of Systemic Life Quality

This structure was obtained by computing the intercorrelation matrix of each 16-item-set and running it by one of the MDS procedures (SSA-1,

see Guttman, 1968; Shye, 1978; 1985a, b). This kind of analysis was considered appropriate because it yields a spatial representation of observed items, from which a depiction of the interrelationship systemic functioning modes can be inferred.

The structure of the empirical data was examined with respect to each of the following:

a. *Sign of the correlation coefficient.* It was hypothesized that all pairwise statistical correlation coefficients in the 16-item matrices would be nonnegative (i.e. positive or zero). Such a finding provides an important empirical support for considering the QOL item set, which taps diverse contents, as belonging to a unified, coherent conceptual entity.

As expected, all (120 coefficients per 16 item matrix \times 4 matrices = 480) coefficients turned out to be nonnegative. This finding was consistently repeated in each of the four separate item sets.

b. *Content criteria for item regional concentration.* It was hypothesized that in a MDS graphical depiction of items (where each item is represented by a point in space so that the distances between items represent correlation coefficients between them: The larger the correlation the smaller the distance, simultaneously for all 120 item-pairs), items pertaining to a particular mode of the GHS (i.e. a subsystem of human individual) would occupy a well defined contiguous region; that is, a region uninterrupted by items of another mode. Empirical confirmation of this hypothesis is important for empirically ascertaining the distinctness of the formulated concepts, and, in fact, for regarding them as subsystems within the overall life quality model.

Two-dimensional SSA yielded, for each item set, a map which essentially confirmed the distinction hypothesis: Regions of fairly simple shapes were easily identified, each containing the four items of a particular subsystem (the personality, the physical, the social and the cultural). In the case of one item set (set III, of sampling items) two items appear to deviate from their subsystemic regions: the integrative-physical which aligned itself with the personality region; and the expressive-cultural which appeared near the expressive social item.

The essential confirmation of this hypothesis, permitted consideration of the next.

c. *Spatial arrangements of the subsystems.* A particular spatial arrangement of the subsystem in the MDS space was anticipated, which would place the personality opposite cultural subsystem; and social opposite the physical. The rationale for this hypothesis is based on the axiomatic and theoretical deliberations discussed above which led to the formulation of the four subsystems and their Cartesian representation in Figure 1. (See also Parsons, 1953.)

Two-dimensional SSA confirmed this hypothesis for the two covering item sets. (See Figure 2.) For the sampling item sets the expected spatial arrangements of the life quality subsystems emerged only upon examination of two dimensional projections of 3- and 5-dimensional SSA solutions. This came as no surprise since item sampling introduces a random element (in fact, additional, unspecified facets) which results in more complex regional outlines. Our general conclusion was that the expected arrangement was clearly present although the possibility of

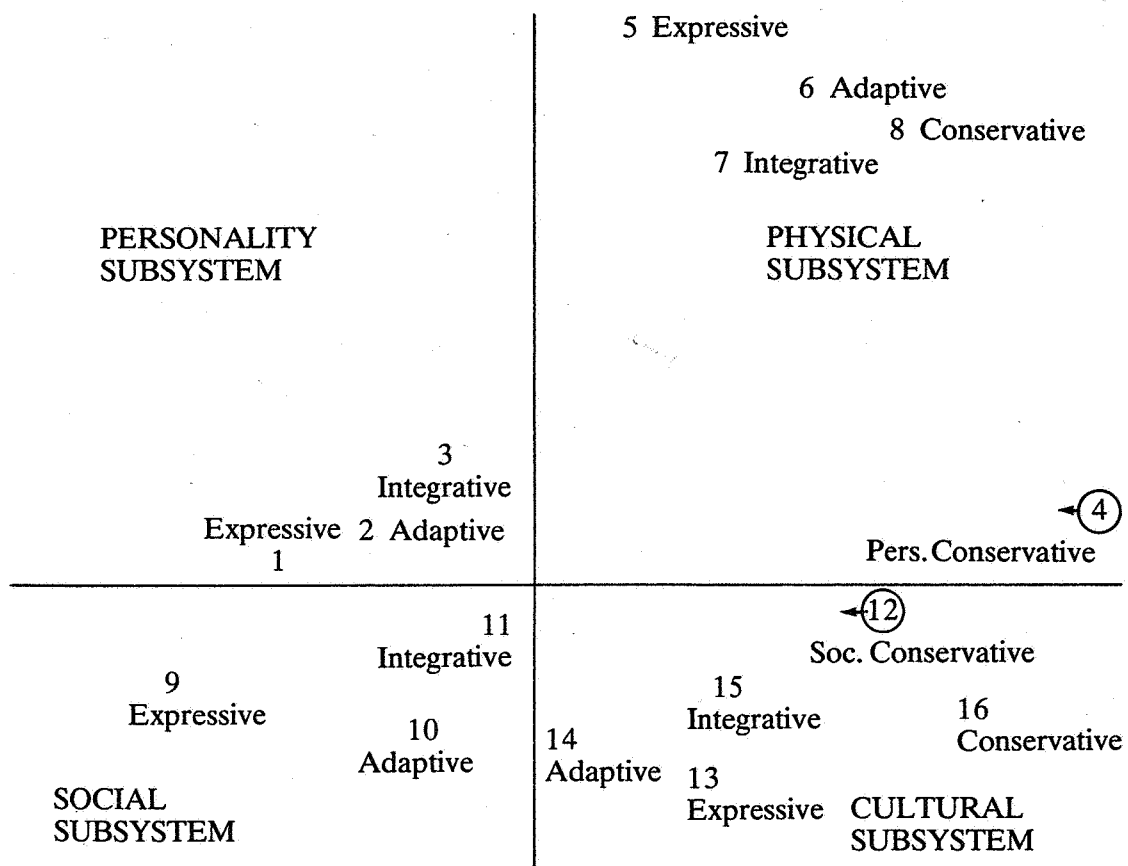


Fig. 2. Human life quality space. Observed SSA of 16 covering items depicts a partition into subsystems mutually oriented in space as predicted by System Theory (compared with Fig. 1).

competing hypotheses could not be excluded (see also Shye, 1985a, ch. 7).

In conclusion: The systemic life quality as defined is a coherent notion exhibiting four major mutually exclusive components — the subsystems — whose interrelations may be described geometrically by the spatial orientation depicted in Figures 1 and 2.

The Scalogram Reliability of the Facet Model

While the covering items may be taken to operationally define human life quality, the sampling QOL items introduce specific contents not specified by the essential QOL facets. Since in questionnaires sampling-item sets are often preferred, because of their easier wording, it is of interest to examine how close are QOL measurements conducted on their basis.

From each item set a scalogram was created for measuring the life quality of individuals. The scalograms were created by Partial Order Scalogram Analysis (POSAC/LSA, Shye, 1985a) which produces the most prominent axes, or scales, for multidimensional measurement. Correlational coefficients were computed between the joint axes, assessing overall life quality, obtained from item sets I (sampling items) and II (covering items); and, separately, between the joint axes of item sets III (sampling) and IV (covering). The coefficients were, respectively: 0.57 and 0.45. These coefficients may be regarded as quite high especially if we recall that they are computed between very different sets of items, affiliated only by abstract systemic constructs. Yet, further experience with selecting sampling QOL items could further improve the reliability of sampling item sets.

6. APPLICATION OF SYSTEMIC LIFE QUALITY MODEL TO URBAN RENEWAL PROJECT EVALUATION

The systemic life quality model has been applied to the evaluation of several environmental projects (e.g. Shye *et al.*, 1980; Joelson *et al.*, 1982). Here we shall briefly describe its application within a national project undertaken to renew certain urban neighborhoods for the purpose of improving the life quality of their inhabitants.

Ir Ganim/Qiryat Menahem neighborhood (henceforth IG) in the outskirts of Jerusalem was among those designated as "distress neighborhoods". Distress neighborhoods were assumed to harbor physical and social environmental factors which adversely affect the quality of life of their inhabitants. The measuring instrument of systemic life quality was employed in IG in order to ascertain that a state of deficient life quality indeed exists, as indicated by labelling IG a distress neighborhood, and to provide a base line against which development efforts and investment can be subsequently evaluated. The study also explored associations between individuals' exposure to particular physical environmental conditions and their life quality in an attempt to identify those conditions that may affect, or be affected by, QOL.

It is reasonable to assume that the designation of distress neighborhood was done relative to nationally prevailing norms. Hence the designation suggests that residents of IG have a lower probability of enjoying a satisfactory level of QOL than do residents of urban areas in the country in general. To use systemic life quality measurements as a diagnostic tool in this case, relative assessments must be made. While the QOL survey was conducted in IG, an identical one was conducted in a nationwide survey of urban centers. The relative QOL coefficient for IG was then computed by dividing the percentage of IG residents who enjoy a high life quality by the corresponding percentage recorded nationwide.

$$\text{Relative QOL coefficient} = \frac{\% \text{ Enjoying Hi QOL in IG}}{\% \text{ Enjoying Hi QOL nationwide}}$$

To permit detailed analysis, this was done for the total QOL index as well as for each of the sixteen systemic life quality components. The general hypothesis was, of course, that life quality in IG would be lower than in the urban centers in Israel; that is, that the relative life quality coefficient would be less than 1. No detailed hypotheses were formulated in advance concerning the relative life quality in each of the specific life quality components, except for anticipating a particularly low coefficient in the adaptive mode of the physical subsystem.

Table III below presents the Relative QOL coefficients for each of the sixteen QOL components as well as for the total QOL

Inspecting Table III one may conclude the following: (1) IG is indeed

TABLE III
Relative QOL coefficients in IG neighborhood in each of the sixteen systemic life quality components (a heuristic description illustrates the significance of each mode)

Subsystem: Mode	Personality	Physical	Social	Cultural
Expressive	Self actualization 1.00	Physical activity 0.90	Social influence 0.85	Cultural-educational activity 0.90
Adaptive	Personal recreation 0.65	Physical conditions 0.71	Institutional roles 0.84	Cultural compatibility w. environment 0.85
Integrative	Peace of mind 0.90	Physical health 0.96	Intimate friendship 0.68	Integrity of values held 0.91
Conservative	Self confidence 0.90	Physical security 1.14	Social confidence 0.91	Stable structure of beliefs 0.92
Total QOL			0.79	

a problematic, if not a distress, neighborhood. The coefficient of 0.79 recorded for the total QOL indicates that the chances of enjoying a high level of QOL in it are some 20% less than in the average urban areas in Israel. (2) As anticipated, the relative QOL coefficient in the physical adaptive mode (roughly translatable as physical conditions) turned out to be particularly low, 0.71. In any case, it is somewhat lower than that of the total QOL. But, (3) in two additional life quality components even worse states were recorded: Personality-adaptive mode (roughly personality-environment compatibility, akin to opportunities to recreate and effective diversion), and social-integrative mode (roughly, compatibility among social roles, akin to intimate interpersonal relations), where the coefficients were 0.65 and 0.68 respectively. (4) In all other QOL components coefficients were quite high yet almost all below 1 (i.e. less than the national urban average). Specially noteworthy is the physical-conservative mode, (roughly, physical security) a component in which a coefficient higher than 1 (1.14) was recorded. That is, in this respect, IG residents enjoy a better functioning. This phenomenon is apparently not accidental as it was observed in other "distress neighborhoods" as well (c.f. Joelson *et al.*, 1982).

Relationship between Environmental Conditions and QOL

Although no causal relationship may be attributed to statistical correlations between environmental conditions and QOL, the interest in searching for and identifying physical environmental factors that are most highly associated with life quality stems from the following considerations:

1. Manipulation of the physical environment, though costly, is easier than that of other factors of human conditions in social structure of value systems. In discomfort, people (including social policy makers) often tend to consider adjusting or reshaping their physical environment for relief.

2. Although a causal relationship may not be automatically assumed between environmental factors and QOL, in some cases it may be assumed or tested.

3. In cases where environmental factors and QOL — or an aspect of QOL — are interdependent as in vicious cycle, it may be hoped that an improvement in the former would break that cycle and start a process that would eventually lead to the desired QOL improvement.

In the study reported here a list of over sixty environmental factors was created after an open-question pretest and in-depth interviews conducted with neighborhood residents as well as local social workers. The list contained items from the domains of housing, the immediate neighborhood environment, public services, shops, transportation, and many more. Respondents rated their exposure or positive evaluation with respect of each of the factors in the list.

Table IV presents, for each QOL component (and for the total QOL) the three physical environmental factors most closely associated with it, provided the recorded monotonicity coefficient between them was at least 0.25.

As Table IV indicates, very few of the many environmental items reached any significant relationship with any of the QOL components. This is in general agreement with other studies which found low correlation between environmental conditions and perceived life quality (e.g. Shin and Johnson, 1978).

Note that more environmental factors were found to be correlated with the adaptive modes of the various subsystems than with any of the

TABLE IV
QOL-related environmental factors

Mode	Personality	Physical	Social	Cultural
Expressive	Car own. 0.35 Apt. own. 0.34 Good heating 0.31	—	—	Car own. 0.28
Adaptive	Apt. size 0.32 Immed. nbhd. 0.32 Bldg; Kind of neighbors 0.28	Good apt. 0.42 Car own. 0.41 Spacious rms; Good heating 0.39	Car own 0.37 Entrance to bldg. 0.31 Apt. own. 0.28	Kind of nbrs. 0.43 Immed. n. 0.33 Bldg. clean 0.31
Integrative	Entrance to bldg. 0.27 Good heating 0.27 Hot water 0.25	Car own. 0.42 Apt. size 0.25	Bldg. well located 0.26	—
Conservative	—	—	Car own. 0.29	—
Total QOL		Car ownership Apt. ownership Bldg. courtyard well tended	0.42 0.39 0.34	

other modes. Since that mode concerns systemic functioning in relation to external events, this is of course, no surprise. It is interesting to note the unexpectedly prominent role of car ownership in its association with life quality. Evidently, car ownership does not represent mere physical comfort but also has considerable significance in the realms of social interactions and even personality. But clearly, various aspects of residents housing constituted the most important environmental factors for life quality in the neighborhood. Among those examined: Apartment ownership, apartment size, the quality of the condominium building are associated with several QOL components.

While a discussion of the implication of these findings for the urban renewal project are beyond the intention of this paper, it may be of interest to examine how are these findings, based on systemic QOL model, corroborated by evidence of a different nature.

Comparison of Environmental Evaluations: QOL Model vs. Residents Reports

Problematic environmental conditions were identified in each of IG neighborhoods' 15 subregions by two different procedures as follows:

1. Systemic QOL model criterion: In the entire neighborhood population, an environmental condition correlates relatively highly with a QOL systemic component, *and*, in the particular subregion, a distress was recorded in that QOL component.

2. Popular demand criterion: A substantial proportion (> 30%) of the residents of the particular subregion expressed the opinion that a given environmental condition is of special importance to them, as well as a dissatisfaction with the current state of that environmental condition.

After environmental conditions were classified as pertaining to one of the four domains, apartment, building, immediate neighborhood and public services, each subregion in the IG was scored as more or less problematic with respect to each domain. This scoring was carried out twice: By the systemic QOL model criterion and by the popular demand criterion. Two independent scalograms were then created to assess the relative environmental quality in the 15 subregions. Each scalogram turned out to be two-dimensional with the following major axes: The *joint axis* measuring the overall environmental quality; and

the *lateral axis* indicating whether the environmental problem is focused on residence (apartment and building) or on the wider circle (immediate neighborhood and public services). The monotonicity coefficient between the two scalograms joint axes was high (0.70) and between the lateral axes even higher (0.97). Hence conclusions obtainable from the systemic QOL model procedure are strongly supported by those obtained from the "popular demand" procedure.

7. CONCLUSION

This paper develops, on the basis of explicit assumptions and axioms, a conceptual framework for observing the effectiveness of functioning of action systems, and, in particular for the human individual. The framework is used to construct a facet definition of human quality of life (QOL) which is claimed to be exclusive and exhaustive: The contents of the observational items it produces do not overlap and cover the entire QOL universe. A specification of two facets: the subsystem facet (personality, physical, social, cultural-value) and the functioning mode facet (expressive, adaptive, integrative, conservative) results in 16 content areas, each of which can be represented or covered by an observational item. The systemic QOL measuring instrument is examined with respect to its reliability and validity.

Structural hypotheses whose rationale is grounded in the elementary considerations that led to the systemic model of QOL are formulated, tested and are largely confirmed.

Finally, the systemic QOL model is applied to the evaluation of life quality and environmental conditions in a neighborhood designated as "distress neighborhood" within national urban renewal project.

REFERENCES

- Andrews, F. and McKennel, A.: 1980, 'Measures of self-reported well-being: Their affective, cognitive and other components', *Social Indicators Research* 8, 127-155.
- Andrews, F. and Withey, S.: 1974, 'Developing measures of perceived life quality: Results from several national surveys', *Social Indicators Research* 1, 1-26.
- Andrews, F. and Withey, S.: 1976, *Social Indicators of Well Being: Americans' Perceptions of Life Quality* (Plenum Press, New York).
- Bauer, R. A. (ed.): 1966, *Social Indicators* (The M.I.T. Press).
- Buckley, W.: 1967, *Modern Systems Research for the Behavioral Scientist* (Adeline, Chicago).

- Campbell, A., Converse, P., and Rodgers, W.: 1976, *The Quality of American Life* (Russell Sage Foundation, New York).
- Dalkey, N.: 1972, *Studies in the Quality of Life* (Health & Co., Lexington; The Rand Corporation, Santa Monica).
- Gratch, H. (ed.): 1973, *25 Years of Social Research in Israel* (Jerusalem Academic Press, Jerusalem).
- Guttman, L.: 1957, 'Introduction to facet design and analysis', In *Proceedings of the Fifteenth International Congress of Psychology*. Brussels (North-Holland Publishing, Amsterdam).
- Guttman, L.: 1968, 'A general nonmetric technique for finding the smallest coordinate space for a configuration of points', *Psychometrika* 33, 469–506.
- Guttman, L.: 1977, 'What is not what in statistics', *The Statistician* 26, 81–107.
- Inglehart, R.: 1977, 'Values, objectives, needs and subjective satisfaction among western publics', *Comparative Political Studies* 10, 429–458.
- Joelson, A. et al.: 1982, *Life Quality and Community Environmental Development in Or-Yehuda* (The Israel Institute of Applied Social Research, Jerusalem).
- Levy, S.: 1976, 'On the use of mapping sentences for coordinating theory and research; A cross cultural example', *Quality and Quantity* 10, 117–125.
- Levy, S. and Guttman, L.: 1975, 'On the multivariate structure of wellbeing', *Social Indicators Research*, 2, 361–388.
- Milbrath, L. W. and Sahr, R. C.: 1975, 'Perceptions of environmental quality', *Social Indicators Research* 1, 397–438.
- Parsons, T.: 1953, 'A revised analytical approach to the theory of social stratification', in R. Bendix and S. M. Lipset (eds.), *Class Status and Power: A Reader in Social Stratification* (The Free Press, New York).
- Parsons, T.: 1978, *Action Theory and the Human Condition* (The Free Press, New York).
- Raveh, A.: 1978, 'Finding periodic patterns in time series with monotone trend: A new technique', in Shye (ed.), *Theory Construction and Data Analysis in the Behavioral Sciences* (Jossey-Bass, San Francisco).
- Schneider, M.: 1975, 'The quality of life in large American cities: Objective and subjective indicators', *Social Indicators Research* 1, 495–510.
- Shin, D. and Johnson, D.: 1978, 'Avowed happiness and overall assessment of quality of life', *Social Indicators Research* 5(4).
- Shye, S.: 1976, *Environment and the Quality of life* (The Israel Institute of Applied Social Research, Jerusalem Research Report No. 602/H).
- Shye, S.: 1978a, *Theory Construction and Data Analysis in the Behavioral Sciences* (Jossey-Bass, San Francisco).
- Shye, S.: 1978b, 'The mapping sentence technique for research design and content analysis', Part 4 in *Theory Construction and Data Analysis in the Behavioral Sciences* (Jossey-Bass, San Francisco).
- Shye, S.: 1979, *A systemic Facet-Theoretical Approach to the Study of Quality of Life* (The Israel Institute of Applied Social Research Jerusalem) (Research Report No. 764).
- Shye, S.: 1982, 'Compiling expert opinions on the impact on environmental quality of a nuclear power plant: an application of a systemic life quality model', *International Review of Applied Psychology* 31, 285–302.
- Shye, S.: 1985a, *Multiple Scaling* (North Holland, Amsterdam).
- Shye, S.: 1985b, 'Smallest Space Analysis', *The International Encyclopedia of Education* (Pergamon, Oxford).
- Shye, S. and Wozner, Y.: 1978, *Organizational Quality: A Conceptual Framework and Empirical Structure* (The Israel Institute of Applied Social Research, Jerusalem).
- Shye, S. et al.: 1980, *Life Quality and Community Environmental Development in Ir-Ganim* (The Israel Institute of Applied Social Research Jerusalem).

- Smith, E. V.: 1978, 'Four issues unique to socio-cultural indicators', *Social Indicators Research* 5, 1.
- Turner, J. H.: 1974, *The Structure of Sociological Theory* (Dorsey Press, Homewood, Illinois).
- Wolins, M., Wozner, Y., and Shye, S.: 1980, 'Rejuvenating the asylum: A field study', *Social Work Research and Abstracts* 16, 17-25.
- Wolins, M. and Wozner, Y.: 1982, *Revitalizing Residential Settings* (Jossey-Bass, San Francisco).

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