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The Human Ecosystem: A Model



The framework discussed in the following article evolved while designing a research project on stability and change and the quality of life in a rural Michigan county. The research was funded by the Michigan Agricultural Experiment Station, Project Nos. 3151 and 1249. The senior author developed preliminary portions of the paper at the Rockefeller Foundation Study and Conference Center at Bellagio, Italy in November 1974.

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We have become increasingly aware that we are interdependent creatures rather than independent organisms. We are interdependent not only with each other and other living species but also with the total environment in which we live. This holistic view of individuals and groups in their association with the physical, biological, and social conditions and events around them provides a frame of reference that has come to be generally known as human ecology. Many disciplines and applied fields—psychology, sociology, geography, health, and home economics—have begun to use a human ecological perspective.

In this article we outline a human ecological model that starts with a view of the total phenomenon being studied—for example the

family—in its complexity and multiplicity (1) rather than starting from one discipline's perspective. This model uses concepts from the natural and social sciences and the humanities. It offers a more comprehensive framework for analyzing human behavior and activities than does a more narrowly bounded social systems model. The latter type frequently minimizes interrelationships between natural and social systems. In this article we also offer the possibility of a common language that can help unify concepts from various disciplines.

We believe our model (1) offers a framework for research and study of human behavior; (2) provides a basis for administrative organization within colleges and universities and for delineating and integrating home economics subject matter; and (3) provides a locus for study within and between home economics disciplines.¹

Human Ecological Model

A human ecological model follows a general ecological model that views organisms as interacting with their environment. The organism, its environment, and their interaction is called an ecosystem.

The human ecological model evolves from ecology as it is applied in the biological sciences and from human ecology, which historically has been a field within sociology. However, we are not using the model from a strictly biological or sociological point of view.

Our model gives some attention to the spatial dimension of organisms in relation to their environment and also takes account of cultures and values that influence human relationships and people's adjustments to and modifications of their environment (2). Our model goes beyond a primary concern with social organization or the community as a major focus in human ecology (3).

From our perspective a human ecosystem includes human beings existing in interaction with the total environment. A human ecosystem involves circulation, transformation, and storage of energy, matter, and information through biological, physical, and social processes (4). A human ecosystem has three

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central organizing concepts: human enviroined unit, environment, and the interactions between and within these two (5).

Figure 1 presents a model of a human ecosystem. The concept comes from the work of faculty and students at Michigan State University's College of Human Ecology (6-12). The model itself is adapted from Morrison (13).

Human Enviroined Unit

In the center of figure 1 is the human enviroined unit (HEU), which can be either (1) a single individual (with biophysical, psychological, and social dimensions) or (2) a group of individuals (such as the family) who have some feelings of unity; share some common resources, goals, values, and interests; and have some sense of common identity.

Neighborhoods, villages, cities, and states are also human enviroined units. All are located in a particular space in time.

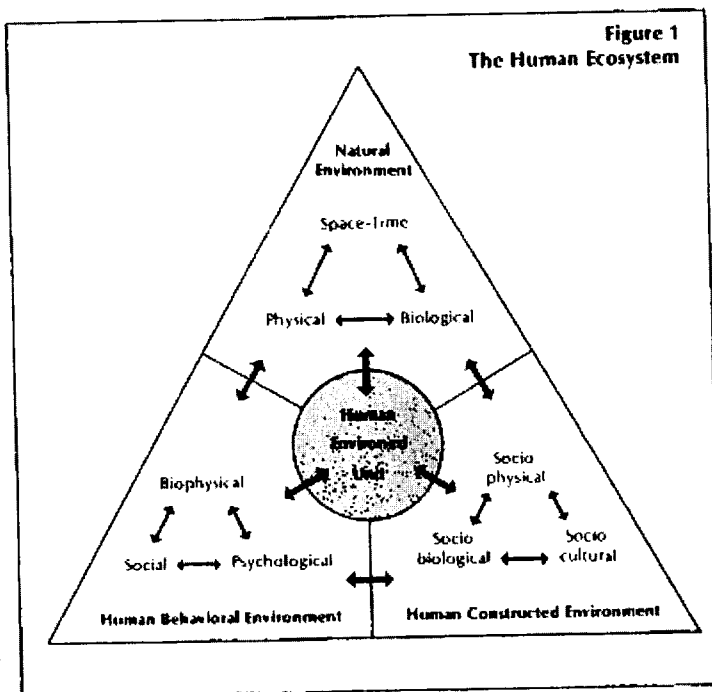
Environments

"'Environment' is the sum total of the physical, biological, social, economic, political, aesthetic, structural surroundings for organisms" (14). In our model (see Figure 1) we include three conceptually distinct but interrelated environments: natural, human constructed, and human behavioral. While the figure shows the three environments as separate, to present their components more clearly, in actuality they are embedded within each other (see Figure 2). These environments furnish the resources necessary for life.

Natural environment (NE). This is the environment formed by nature with space-time, physical, and biological components. We have defined space as the unlimited three-dimensional expanse in which events occur and in which matter and energy exist. Time is the continuous duration in which events occur and are sequentially related to one another, as in the past, present, and future.

Because time and its measurement are based on the earth's movement in space, we have combined space and time into a single component of the natural environment. The physical component of the natural environment includes such factors as atmosphere, climate, soil, water, minerals, and topographical features. The biological component includes plants, animals, and microorganisms.

The natural environment's space-time, physical, and biological components are interrelated. Soil, for example, contains both physical elements and biological organisms. Varieties of wild plants grow in particular climatic zones with characteristic soil



conditions; similarly, a range of animal species are native to different climatic areas. The natural environment supports human life in that it provides the energy and materials on which all life depends. When considering phenomena from a human ecological perspective, the natural environment must be taken into account.

Human constructed environment (HCE). This is defined as an environment altered or created by human beings. It includes modifications made by humans of the natural environment's physical and biological components and other social and cultural constructions.

The sociophysical component includes human alterations of the natural physical environment as well as constructed objects such as roads, mines, leveled and cultivated land, polluted air and water, buildings, paintings, sculpture, clothing, dishes, machines, and a multitude of other tangible objects. The sociobiological component encompasses human alterations of microorganisms, plants, and animals, including humans. Domesticated and new breeds of animals, new and improved plant varieties, planted forests, cultivated crops, and genetic manipulations are examples. The sociocultural component of the HCE includes cultural patterns, such as technology, language, laws, values, and aesthetic standards, which provide the basis for communications, order, and

Footnote

"We offer examples of clothing when elaborating aspects of the environment and interactions that occur in the ecosystem. Parallel examples from other content areas of home economics, such as housing, child development, management, and food, are appropriate. The model could also be applied at all teaching levels and in extension, research, and family counseling.

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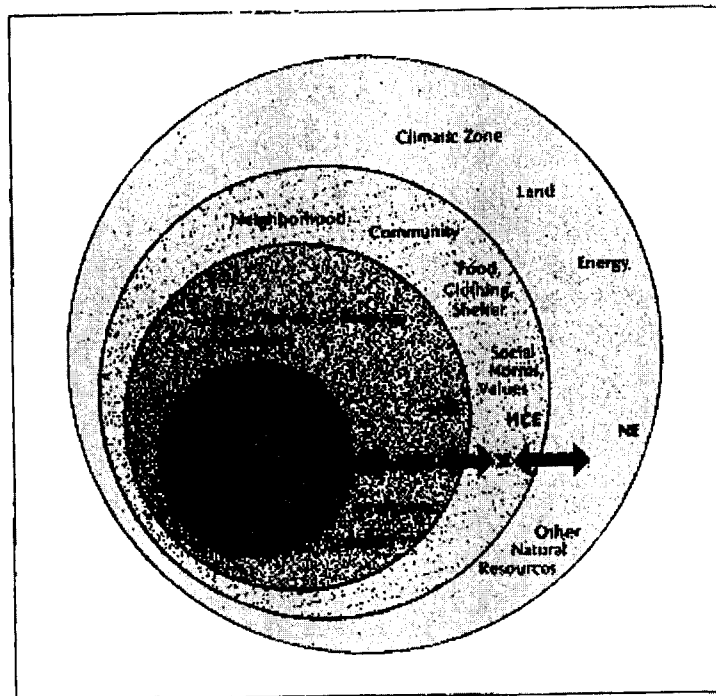


Figure 2. A Human Ecosystem Illustrating the Near HBE, HCE, and NE

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coordination of human activities. Social institutions that perform essential societal functions are also part of HCE's sociocultural component.

Clothing illustrates the interrelationship of the HCE's three components. The domesticated animal or cultivated plant is converted by tool-using humans into fabrics for garments whose use is governed by social norms and customs as well as by the natural conditions of climate and geography.

The human constructed environment is a product of man's intellectual and social capacities and his adaptation of the natural environment to meet physical, biological, social, and psychological needs and desires.

Human behavioral environment (HBE). This is the environment of human beings and their biophysical, psychological, and social behaviors. Human beings can be considered as part of the environment and as external to the human environed unit because people constitute environments for each other.

The HBE's biophysical component includes people's presence—their bodily movements and physical posture. The psychological component includes people's thoughts and emotions and incorporates their values, attitudes, and sentiments. The social component includes interacting persons and

groups and short- and long-term relationships. The physical presence and interaction of human beings, the clothing they wear, and accompanying thoughts and feelings about the adequacy, comfort, and beauty of their clothing are examples of the human behavioral environment modified by human constructions.

The human behavioral environment is essential for meeting biological and physical needs and the social and psychological needs for love, relationships, communication, knowledge, and self-fulfillment. These are necessary for existence beyond survival (75).

All components of the environment exist objectively, whether or not individuals or groups are aware of them. Environments also have subjective reality to the extent and manner that individuals and groups perceive them.

Interaction

The third organizing concept of an ecosystem is interaction, that is, a relationship of reciprocal influence among a system's components. Interaction in an ecosystem occurs when any part of an ecosystem influences or acts on any other part and is influenced or acted on in return.

Our examples have shown that interaction takes place among components within an environment. Interaction also takes place within the environed unit, among the environments, and between the environed unit and environment(s). Humans are dependent on all components of their environment to satisfy needs and desires. They affect their environment which, in turn, affects them. In a human ecosystem, the interaction between people and their environment is most important.

In the empirical world interactions between people and the three environments occur simultaneously. For purposes of analysis, however, let us focus on interactions between an environed unit and any part of the environment. Following is an example of the interactions of a human environed unit (HEU)—a person—with the three interrelated environments.

An adult male living in Michigan in the winter of 1978 (HEU) selected clothing from his wardrobe (HCE) based on the climate (NE) and his ideas of suitability based on social convention (HCE). He selected his clothes in anticipation of specific social interactions (HBE) and types of physical and social activities. His interactions with colleagues and friends (HBE) were influenced by his clothing (HCE), his feelings about himself, and by the temperature in his work situation (HCE). In



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turn, the temperature in his work situation was influenced by the outside temperature (NE).

The Near Environment

An ecological model conceptualizes small as well as large ecosystems. Our model is particularly useful for home economics because of the profession's emphasis on the family in the near environments. The near environment includes the home and local community within the context of the larger and more distal environment. The near environment is also that part of the environment closest physically, psychologically, and socially to human beings. Individuals and families in their near environments constitute relatively small ecosystems.

Figure 2 presents examples of the near human behavioral, human constructed, and natural environments. In this figure the HBF is shown embedded within the HCE which, in turn, is embedded within the NE. The arrows show the mutual interaction that takes place between and among the environments and the human envired unit. In the example the figure illustrates, the HLU is an individual. Family, friends, colleagues, and schoolmates are examples of the near HBE.

People's clothing is considered their near human constructed environment at the most intimate, or closest range. The place where an individual or family lives, including equipment and furnishings, constitutes another dimension of the near human constructed environment. Adjacent grounds, plantings, buildings, and streets of the neighborhood and the local community are all parts of the near human constructed and natural environments.

Near environments have abstract dimensions as well as concrete objects, persons, and places. For example, there are many norms for clothing, depending on situations, age, sex, or socioeconomic groups. Aesthetic judgments exist about appearance of dwellings and grounds based on condition, style, cleanliness, and notions of beauty, for example. Families and other groups have their own rules governing relationships and the use of clothing, equipment, food, space, and furnishings. Similarly, members of a neighborhood often have customs concerning care and upkeep of grounds, snow shoveling,

to the envired unit and limited or extended depending on the purposes of a particular analysis. There are interactions among the distal and near environments and the human envired unit, for example, state and federal governments (distal environment) influence local communities (near environment) as well as individuals and families (human envired unit). In turn, individuals and families influence governmental decisions. Decisions made on the federal level about supplies and fuel allocation ultimately affect the individual or family, clothing choices, housing temperature, and human behavior and interaction. Thus, the distal environment comes "close to home." In addition, individual and family decisions about fuel and clothing use affect supplies and policy.

Application to Home Economics

We propose that the ecological framework described in this article can help relate concepts from the humanities and the biological, physical, and social sciences within home economics and human ecology. The human ecological model is in a preliminary stage of development and needs more elaboration. As presented here, the model provides a framework for conceptualization, a useful first step in building propositional theory.

In this article we have outlined and defined the basic components of a human ecosystem. Additional concepts are necessary for building a dynamic systems model and for extending the model for research and analysis. Such additional concepts would include: systems maintenance, equilibrium, homeostasis, boundaries, interface, negative and positive feedback, and entropy.

Systems concepts have been used in several recent works in home economics and human ecology and related fields. Deacon and Firebaugh (16) present a discussion of systems concepts in relation to home management. Kantor and Lehr (17) offer a systems framework for a theory of family process. Morrison (18) presents a systems framework useful in housing and energy research. Using systems concepts coupled with an ecological approach, Paolucci, Hall, and Axinn (19) examine the family ecosystem with an emphasis on family organization and decision

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