
Ecological Systems Model for Occupational Therapy

(theory, adaptation, environment)

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This article presents a conceptual model for occupational therapy: the ecological systems model. The developing individual is viewed as an open system interacting with the environment. Both humans and their environment are interconnected, joined in shaping each other. States of health and illness can be seen as reflections of ecological adaptation. Function or dysfunction is evaluated in terms of persons' effectiveness in achieving their own goals, for their own quality of life, in their interactions in the ecosystem. If performance of necessary tasks and roles is effective in achieving those goals and in harmony with the needs and goals of the external systems, then behavior is functional.

The decade of the '70s is a period in which the profession has been concerned with developing a distinctive theoretical base, as Reilly proposed, to "support the quality of the life adaptation of patients." (1, p 244) The search has been for a model that will delineate both the similarities and the differences that occupational therapy shares with

other professions such as medicine, education, psychology, sociology, and public health, as well as a model that will provide a common theoretical base for the diversity of occupational therapy.

By definition, a model is a representative plan or structure "that may be used for imitation or comparison," a design that can be adapted and later reproduced in a more permanent form (2, p 419). It is an ideal construct against which to compare specific phenomena. The ecological systems model has been developed over the past 5 years, yet its complexity demands further research to refine and clarify its multiple elements. The model provides a valuable support for practice. For the clinician who experiences burnout from self-doubt in the face of difficult clients, for example, the perspective of this model calls attention to alternative factors such as structural barriers for therapeutic interaction. Another example is the case of students in short-term clinical placements who experience frustration in the face of long-term client problems: the model provides a conceptual structure with which to recognize short-term interventions as parts of a long-term treatment process. This model has also been found useful at Tufts University-Boston School of Occupational Therapy as a basis for curriculum design by supplying a coherent logic for the sequencing of course material.

Ecology, the study of the relationship between organisms and their environment, provides an excellent context for conceptualizing the theoretical goals of occupa-

tional therapy, and for evolving a model showing the individual embedded in social life. States of health and illness can be seen as reflections of ecological adaptation. The growing individual is viewed as an open system participating as part of an ecosystem. Both humans and their environment are interconnected, joined in shaping each other. The ecological systems model is based on concepts presented by General Systems Theory (3) and the studies of Lewin (4), Auerswald (5), Bronfenbrenner (6), Barker (7), and Wicker (8).

Within the conceptual model, the goal of the occupational therapist is to enhance individuals' ability to cope with the environment, to adapt to it, to change it, and to master whatever range of life-tasks and activities that will enable clients to accomplish their personal goals in relationship to themselves and to the surrounding systems—that is, family, workplace, community. The therapist achieves these ends by: 1. Selecting and using a conceptual framework that allows the inclusion of the multiple aspects of the patient and the environment and what might be considered normal function; 2. Evaluating the degree of function or dysfunction in the individual's physical, psychological, and social interactions with the environment; 3. Planning and implementing remedial measures to increase the individual's degree of function (these measures may include both adaptive activities undertaken by the individual and modification in the environment whenever possible); and 4. Designing and implementing measures to

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prevent the development of dysfunctional states.

The following section will set forth the model's description of the individual as an open system; the layers of the environmental system; life tasks, roles, and lifeskills; motivation; and the concepts of functional and dysfunctional behavior. Therapeutic intervention, in the light of the model's assumptions, will be discussed in the final section.

An Ecological Systems Model of the Individual

The Individual as an Open System.

Systems can be categorized as closed or open. A closed system is one that admits no matter from outside itself and has no transactions with its environment. Open systems interact extensively with their environments, openly give out and take in matter and energy from the environment, and can regulate themselves in an effort to maintain their form and order. Living organisms, including humans, possess these characteristics of an open system (9).

The ecological system approach entails the examination of individuals, their environments, and the continuously changing processes of interactions between them (6). These interactions affect both participants through mutual feedback. Although, in reality, the ecosystem as a whole is one continuous macrosystem of which each subsystem is a single part or collection of parts, it is convenient for the sake of individual therapeutic purposes to view the whole analytically from the perspective of one system—the individual client. Therefore, the model views the ecosystem as if the individual client were at its center.

From this perspective, individuals are seen to have continuous "input" into their own systems through sensory information. They

then process the information received, selecting what information to attend to, organizing it in ways that have meaning for them, interpreting it, and selecting some internal response to it. The sensory input includes messages not only about the physical space around people, but also about verbally and nonverbally communicated attitudes, values, and expectations of the surrounding social world.

As individuals evolve through the stages of human development physically, intellectually, emotionally, and socially, the manner in which they process information becomes increasingly differentiated and individualized. These characteristic internal operations constitute *inner life space*. Being in the nature of process or a set of processes rather than a fixed state, inner life space is analogous to the "throughput" of General Systems Theory, as it consists of a set of operations performed over time.

On the basis of the information received and integrated into through-processing operations, a person responds to the environment with overt behavior, or "output." This behavior is then fed back to the environment, which in turn responds again to that behavior, producing further feedback that serves as new input for the individual. By attending to the feedback from environmental interchange, a two-fold interactive process commonly called experience, individuals can monitor and modify responses and behavior to increase their effectiveness in meeting goals.

Environmental Layers. Being an open system, an individual is viewed as living in a series of nested environmental layers, each embedded within the next (Figure 1). Each of these layers offers both supports and constraints and each can be

analyzed into several dimensions for the purpose of the model. The innermost circle represents the individual's *inner life space* with its cognitive, psychological, and physiological dimensions. The totality of the outer layers with their respective dimensions composed the person's *extended life space*, that is, the space in which the person functions or behaves (4); it comprises two elements: the performance of life tasks and the performance of roles. Each layer has both physical and psychological dimensions. These dimensions include such elements as particular locales, times, objects, activities, potential for participation, and roles. Although these elements have certain objective qualities, peoples' perceptions of them, and thereby their responses to them, may differ. As Piaget (10) observes in his studies of the child, the phenomenological world does not merely reflect what is seen, but also includes an active, creative aspect. Individual observers incorporate into their perceptions elements of their own creative imagination and sense of meaning that the objective environment has for them personally.

The first environmental layer is the *immediate setting*. This includes a person's residence, neighborhood, family, and the other people with whom he or she is in continuing contact. The activity dimension here includes personal care/hygiene and certain leisure and work activities. Roles are primarily familial and residential.

The second environmental layer consists of *social networks*. Included here are peer groups; schools; social clubs and organizations; religious groups, shopping resources; transportation facilities, institutions of health, education, and welfare; the legal system, government, and so

forth. As an individual matures, the complexity and nature of participation in this layer changes; roles gain in importance and activities diversify. For many people, performance of the worker role involves participation in this layer.

The third layer is the *ideological* system, which consists of societal and cultural values. It is this subsystem that implicitly introduces functionally important meanings and motivations into the other layers, including the operations of the social networks, the public and private institutions, and the person's own roles and activities. For example, a prevalent cultural value can effect what health services are available in a health institution and also the price to be paid for the service. Individuals in diverse ideological systems will often attribute diverse meanings to the same form of system in the environment and therefore establish different relationships with it. During adolescence, particularly, individuals may be exposed to these diverse systems and, by contrast, sharpen their awareness and commitment to their values. It follows that in viewing the interactions between individuals and the systems in their environments, the observer must be sensitive to potential conflicts between 1. the expressed values of the systems, 2. the actual values acted out by the systems, and 3. the meanings the values may have functionally for any given individual.

Occupational therapists are concerned with interactions among the elements of the immediate setting, the environment of the social network systems and, the individual, because these influence human development and behavior throughout the life span and, most pertinent to therapy, the interchange between patient and therapist.

Therapists seek to bring them into operational harmony as much as possible and will consider the individual's dimensions of meaning and value in relation to functional goals. Therapists will necessarily therefore also become concerned with motivation, which will be discussed later.

Life Tasks, Roles, and Life Skills. Functional within the extended life space can be divided into (a) performance of *life tasks* and (b) performance of *roles*. Both require *life skills*. The constant implied by the word *skill* is the ability to perform with *appropriateness*. For the purpose of conceptualization and measurement, two interpretations of appropriateness are suggested: a "sense of coherence" and a "sense of TEMPO." A "sense of coherence" (11, p 123) is described as an individual's general orientation that sees life as meaningful and manageable for the individual. A sense of coherence gives one a solid capacity to view and deal with reality in terms of one's goals and one's assets and liabilities, in the ambiance of a specific culture and a specific historical period.

The second interpretation of appropriateness, "a sense of TEMPO," refers to the importance of flow, pace, and timing in the life cycle. The letters in TEMPO stand for the individual's doing "the right Things at the right Time, with right Energy (and Expectancy), in the right Mode, in the right Place, with the right Objects," (12, p 20) to achieve the desired performance. A sense of TEMPO is necessary for people to function well in the society and to find personal fulfillment in their mode of functioning. Life TEMPO and the sense of coherence are suggested measures of the degree of function in life tasks and roles. Evaluation must always be bound

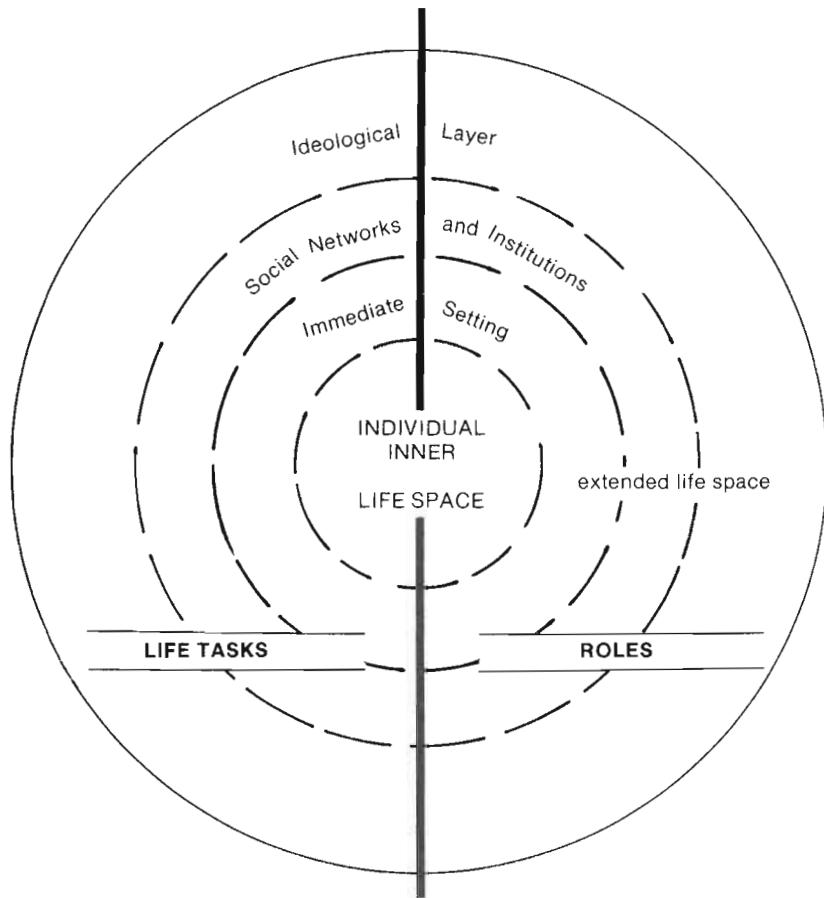
by the specific circumstances such as the social norms of the times or the availability of resources.

Life tasks are purposeful activities per se. These may be performed apart from, or in conjunction with, one or more roles. Black described role within the conceptual framework of systems theory:

A role is a position in society that contains a set of expected responsibilities and privileges. One person may perform several different roles: for example, worker, wife, mother. Within the boundaries of limits of each role, expectations are formed by both society and the occupant of the role [Sarbin TR, 1968]. These expectations serve as input to the individual in his role and influence his behavioral alternatives. The individual then determines his preferred performance output. Each performance is compared with expectations by both the individual and society. The results of this comparison are returned to the society and the individual and are termed feedback. Feedback can be used to alter the system by influencing future expectations and performances (13, p 226).

Since human beings are continuously engaged in developmental and societal processes, and over their lifetimes make many transitions in their role patterns, role acquisition is an ongoing process that transforms and builds on previously acquired skills to enable the individual to assume the demands of a new occupational role (14). Thus tasks previously performed apart from any specific role may become incorporated into the role performance at a later time; conversely, tasks performed in conjunction with a role may, after the relinquishing of that role, become simply tasks

Figure 1



performed for personal satisfaction alone.

Analysis and evaluation of a given person's role and degree of function in those roles will inevitably involve an analysis of such factors as role choice, role balance, role distribution, role conflict, and role overload. These will be further discussed below, under "concepts of functional and dysfunctional behavior."

Motivation and Goals. Each person must interact with environmental systems in order to carry out his or her roles, perform life tasks, and develop life skills. There are two motivations for these activities: the drive to take care of basic needs shared by all living organisms (reducing the internal tension produced by unmet survival needs), and the positive drive that is an intrinsic striving to develop "competence or feelings of efficacy. . . ." (15, p 237), in short, the drive toward self-actualization, accomplishment,

value, meaningfulness. Alternatively, each human being is *driven*, like other creatures, to survival, while simultaneously *drawn forward* toward goals of further development, participation, and meaning to existence through the expression of human potential in a participatory role in the world (16). The actualization of a potential may be in the immediate setting, as in the case of roles in family and neighborhood interactions, or it may consist of some larger role or roles in the society through meaningful work away from the immediate setting. To these ends each person engages in exploration, manipulation of subjects and situations, and a variety of other activities. The response of the environment—that is, people, objects—to these explorations can also affect an individual's motivation by encouraging or discouraging further exploration or performance.

A distinctive property of activities is a "tension system" or goal structure that supports the actors to persist in their actions, to resist interruptions until closure is reached for their activity (4). The presence of perceived intent or goal directedness is relevant for defining activities, either through the presence or absence of a goal, for example, as in daydreaming or sleeping. Goals reify motivation, they give it form. Goals also help to direct and organize behavior over time. An example of this is an individual's life history conceived as a series of events, changes, and goals accomplished. Conversely, goal accomplishment or failure may affect motivation.

Concepts of Functional and Dysfunctional Behavior. Proponents of an ecological approach consider behavior to be the result of inner (personal) and external (environmental) interactions. It is possible within the frame of reference provided by this model to assess more clearly the contributory factors and causes for each form of behavior. Some behaviors will prove to be the product of purely internal processes in the individual's system, and others purely responses to something in the environment. Most commonly, however, behavior will be understood as the comprehensible result of the interactions between a given environmental system and an individual of a given biopsychosocial configuration. Such an analysis takes into account the person's stage of development together with the needs, drives, and skills characteristic of that stage.

Here again it is important to stress the process orientation of the model. Each person is perceived in an environmental context, and also in a developmental context. As Auerswald notes:

In particular, an emphasis which stresses the organization of events in time and traces the movement of the developing infant-child-adolescent-adult-aged individual's degree of participation versus his isolation in relation to his family and to the flow of surrounding community life—such an emphasis makes it possible to determine with much more clarity in what life arenas the individual, the family, or a group of individuals need assistance, and thus to more effectively combat the anomie and dehumanization characteristic of our age. The result is that the targets of therapeutic activity are much clearer and therapeutic work is more clearly focused on forces and situations that are truly etiological in a given problem situation. (5, p 206)

As Auerswald indicates, behavior that might otherwise be termed pathological by the specialist assessing the individual outside the environmental context can, in the ecological analysis, turn out to be actions that “make sense as a healthy adaptation to a set of circumstances” (5, p 212) that prevent socially preferable or more “normal” behavior. Persons act upon, modify, or even significantly change their environment by their behavior, while the environment acts upon them and in turn changes *their* behavior.

Within the perspective of the ecological model, the determination of behavior as functional or dysfunctional is made by an assessment of its appropriateness and effectiveness as part of an individual's performance of life tasks, life skills, and roles, given the available resources. This assessment considers the person's own goals for participating in the environment. If performance of the necessary tasks and roles is effec-

tive in achieving goals, and is in harmony with the expectations conveyed by the external systems, then the behavior is fully functional. This assumes that the expectations of the external systems are humanistic and consistent.

Implications for Practice. Both survival and the actualization of potential involve adaptation, given varying circumstances, to the environment. This principle has been widely recognized in the evolution of species and in human growth and health (e.g., Lorenz, *Behind the Mirror*; Dubos, *Man Adapting*). Dubos goes so far as to say that “states of health or disease are the expressions of the success or failure experienced by the organisms in its efforts to respond adaptively to environmental challenges.” (17, p 170) The adaptive process has been at the center of occupational therapy's theory and practice since its origin as a profession.

The therapist who uses the ecological model will recognize the nature of adaptive response in analyzing the suggesting modifications in the client's relationship to this environment. The strategies designed must take into account the elements identified by King (18) as the four specific features of individual (as opposed to evolutionary) adaptation: 1. that the individual must take a positive role, that is, must act rather than be acted upon (in contrast to the passive role, that he may be permitted, or sometimes encouraged, to maintain in certain forms of medical treatment); 2. that the activity involved in adaptation is called forth by the demands of the environment, that is, is a response to a challenge when a need or a want is blocked by some change or deficiency in the individual or the environment (hence the emphasis of the occupational therapist on

real life environments rather than on the artificial environment of the hospital); 3. that adaptive responses are usually most efficiently organized subcortically so that the *removal* of conscious processes or habits that block adaptive responses to changed environments or states may be as important as any other factor; and 4. that mastery of the environment or of a desired goal is, in Maslow's words, “a powerful reinforcer” so that each successful goal-oriented effort serves to increase potential for further successes.

Evaluation of the client must include an assessment of the appropriate or inappropriate function of life tasks and roles in the various environmental settings in which the client currently performs. The examination of the information on the client may include exploring the past to discover relevant “hidden skills” that may be recovered and that may become once more a meaningful part of his or her adaptation to new circumstances. Past situations in which the client was more functional may be identified so that the therapist and client can analyze elements that contributed to that functional state. Then the therapist and client may draw upon whatever elements continue to be functional or may reasonably be expected to be functional in the future. The therapist also needs to assess the client's goals in terms of changes he or she would like to make in the areas of life tasks and roles. These goals form the core of the treatment program. When the client is unable to engage in mutual goal setting, therapeutic goals may need to be determined by the therapist and/or others involved in the treatment process. Several examples might be: the case of a young child where mutual goal setting is not

possible, and the therapeutic goals need to be set by the therapist and the parent or caretaker; a patient who is part of a deinstitutionalization effort, whose concepts of roles is limited and who does not have a context within which to understand the role of persons living in the community; adolescents who may make impulsive decisions about a career. The therapist does not say "you can't be a surgeon" but sets goals to assist the clients in their selection process by giving information and helping them in making a realistic choice.

In designing a therapeutic program, then, the occupational therapist will facilitate the adaptive process through which an individual may best live and develop. This includes eliciting the client's response in purposeful activity related to the demands of their real life environment and stimulating their subcortical cooperation in the effort by focusing their conscious mind on particular objects or tasks. It also involves selecting a sequence of activities and tasks that can be performed with sufficient success at each stage to give continuous positive feedback. Support is required until a sufficient sense of mastery is achieved so that clients will develop and maintain appropriate and healthy motivation to continue independently in the work of adaptation, healing, and growth. Finally, it is important that the program of adaptive response and purposeful activity be coordinated with the client's own particular goals because this maximizes an active participation in the therapeutic process.

Physical and psychological stress can contribute to the formation of maladaptive, rather than adaptive, behavior. Realistically, these patterns cannot always be altered, but

it is the responsibility of the occupational therapist to look at the whole context in assessing what is to be done. Purposeful activity, as a part of a program oriented to adaptive functioning, can be an integral part of this process. As the environment demands action and reaction from individuals, so does occupational therapy.

Summary

The ecological systems model was proposed to conceptualize the theoretical and practice goals of occupational therapy. Ecology is the study of individual organisms, their environments, and the interactions between the two. Both humans and their environments are interconnected—joined in shaping each other.

The model views the ecosystem as if the individual client were an open system at its center, surrounded by interacting environment layers: 1. the immediate setting; 2. social networks, institutions, and 3. the ideological layer. These layers with their respective dimensions compose the person's extended life space; that is, the sphere in which he or she functions, and comprise both the performance of life tasks and the performance of life roles.

Function and dysfunction were defined in terms of clients' effectiveness in achieving their goals for their own quality of life in their interactions with the ecosystem. The implications that the ecological systems model has for practice and the design of therapeutic programs were discussed.

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