

Occupational Performance Theory as a Support to Design of the Built Environment for Persons with Disabilities

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ABSTRACT

Architectural practice should not be considered only a method of building buildings, but also a process of creating places for those who will use them. The interdependent nature of humans and the environment has provided architects and designers with a challenge; to build not only a space, but also a place in which human performance occurs. Environment -- behavior relations are complex and transactional. An understanding of this relationship facilitates the creation of environments that improve the quality of life for the buildings users. A strong understanding of the complexities of the environment is greatly enhanced by knowledge of the performance of the person. Knowledge of the person as a unique being who assumes different roles, possesses skills, and has attributes (abilities) allows the designer a greater respect of the dynamic experience of a person engaged in activity within an environment. The theory of occupational performance supports the understanding of the person and the persons daily tasks. These models describe human performance components and human performance areas. They also acknowledge that the person is engaged in activity within an environment. These models could prove to be invaluable to designers and architects interested in using knowledge of the persons in conjunction with knowledge of the environment to create spaces for people with disabilities.

INTRODUCTION

The built environment which fails to provide access to all users has developed in most cultures and societies, facilitated by exclusionary policies and actions. This environment, influenced by social values, economics, and policy, has developed over centuries (Law, 1991).

Failure to gain an understanding of human performance can lead to the creation of dysfunctional spaces, that is, spaces which are ineffectual and costly. On the macro/societal level, Pruitt-Igoe, in St. Louis, stands as a monument to designers "mis-understanding" the needs of the tenants who were to live there.

On a smaller scale these issues are less expensive, but influential nonetheless. As an example, during a recent assessment of a public school, it was discovered in the 5 year old children's classroom that a bathroom rehabilitation had been completed to increase compliance with the Americans with Disabilities Act. The new "accessible" commode measured nineteen inches from the floor to the top of the seat. This measurement was in compliance with the Americans with Disabilities Act Accessibility Guidelines. It was noticeably different when compared to the other toilet intended for the five year old. It stood at eleven inches, floor to top of seat. The bathroom was as ineffective as Pruitt-Igoe. Although the results are not as wide sweeping, they are still significant to the users of the space.

Scenarios like these demonstrate the need for an understanding of the users of the environment by those who design the environment. If designers were able to understand the supports that individuals need from the environment, they would be able to create effective spaces for the buildings users.

INCLUSION OF ALL PERSONS

Harlan Hahn, in his introduction to the concept of "access to the environment" for persons with disabilities, notes emphatically that there are not persons with disabilities, but instead there are disabling environments (1996). He argues that chairs in an auditorium are provided for persons who are unable to stand for long periods of time and that is an accommodation or environmental support for persons who don't happen to bring their own chairs (i.e. paraplegics). The concepts of Universal Design or barrier free design (designing for all people of all ages and abilities) is not traditionally taught by design schools. The concept of heterogeneity of the individual is the explicit and implicit rule designers are apprenticed to follow (Psomopolos, 1973). The notion of designing to some fictitious standard (a man in middle years in top fitness) is the hallmark of the homogeneity model. It is also the leading cause of the existence of environments which do not support human performance. Considering the unique needs of user groups is a critical role for the socially responsible designer.

INTERDEPENDENT NATURE OF PERSON AND ENVIRONMENT

Just as the individual cannot be considered in isolation from the environment, the environment cannot be designed without the users in mind. To illustrate: the therapist who rehabilitates clients to perform in a carefully designed hospital environment and then sends them home to a familiar but inaccessible community or home environment cannot be surprised when the client fails to perform basic

living skills. The person who performed the task of emptying the dishwasher and changing their own clothes in the accessible, organized hospital environment may not have a dishwasher in their home, or they may no longer be able to reach their clothing. The person who was independent in all of his daily living skills is suddenly unable to perform the most basic task without help. The professional who allowed the client to go into the community without considering the community context is regarded as irresponsible. In the same way, the designer who creates spaces without the user in mind is correspondingly irresponsible. The difference has been that the designed environment has been generally accepted by society as incongruent with these needs. Prochansky, Ittleson and Rivlin state that there is no dichotomy between the person and the environment. A total environment subsumes man as one of the components of itself, in relationship with other components (1970). The history of the built environment has suggested that unless required by statute, barrier free design is not usually the norm. Lifchetz, (1980) describes how architects and lawmakers felt that the designers of the environment would be so impressed with their ability to create spaces which supported the needs of the users, they would naturally strive to design accessible spaces, whether or not required by law. It was hoped that society would press designers to view the environment as a fundamental base from which one could pursue a life of choice and exercise "civil rights" inherent in society. Instead, designers have played only a minor role in the creation of standards and designs that support the lives of the heterogeneous society in which we live. It has been the individual and others supporting them who have created retrofitted adaptations to a design built to serve the fictitious heterogeneous model.

GAP BETWEEN DESIGN AND SCIENCE

What has prevented designers from creating spaces more in line with the needs of the users? Several reasons have been suggested thus far; social issues, historical context, and economic issues. One significant issue which has been overlooked is the gap between science and its application to architecture and design. The problem has been identified in the literature by many environments and behavior scholars. Windley and Weisman have explicitly described the phenomena as the "application gap" or, the inability of designers to translate research information into design criteria. In their discussion, Windley and Weisman describe three criteria for translation of information to become meaningful and useful for the designer. They are as follows:

1. Provide visual information: Imagible information is more appealing to the designer. Designers with visual paradigms need information that is relevant and meaningful to them and the work they perform. Providing frameworks or structures in a visual way helps them to conceptualize the issues.

2. Provide information that is testable to assist in determining the effectiveness of the solutions. Information should have a measurable outcome. The effects of the changes should be evaluated to determine effectiveness.

3. Provide information appropriate at a variety of levels, to allow generalizability of the material. To provide information which is appropriate across groups and throughout the life span is to provide a useful tool to the designer.

These three suggestions can provide a bridge between the applied social sciences (in this case the models which support occupational science) and the design output.

The following models introduce the person as an entity with skills and innate abilities who performs their intended or desired tasks within a context. The models provide a visual reference for the designer, are easily generalizable, and provide the framework for understanding outcome in the most meaningful of all methods -- measuring the occupational performance of the person.

What follows is an introduction to a body of literature that proposes an identification of the missing piece -- a structure that introduces the functional performance of humans within the environment. This guide is useful for practice. It has provided the foundation for occupational therapists understanding human behavior and could begin to clarify the process in the same way for the designer. The approach explores how humans perform at the basic level (how strong they grip an item, how much stamina they have) within the context of the tasks and activities the person needs to use to complete his or her daily activities (working, taking care of self and family, and leisure activities).

These models are different than other medical models, as they do not focus on the impairment level but consider the functional performance of the person. The difference is made clear when the models are placed within the continuum of the International Classification of Impairments, Disabilities, and Handicaps (ICIDH). This is a taxonomy of people with disabilities devised by the World Health Organization. The ICIDH was the first conceptual classification scheme that differentiated between the levels of disability. The classification included the impact of disease on the organic, functional, personal and social consequences of disease or disability. It provides a framework for understanding the disease process and how it affects people. Impairments are the loss or abnormality of the structure or the function of the organism such as the loss of a limb. Disability is the restriction of the ability to perform activities. This could translate into the persons inability to independently tie their shoes. A Handicap is the disadvantage that results in the inability of the person to perform the roles he/she would normally pursue. It could mean that the person is no longer able to work, or act as

figure. It becomes clear that an understanding of human performance is what is important to the designer. The persons' capacities in terms of moving, grasping, and seeing are relevant, but they must be considered in light of the persons' desired outcome and the activities in which the person participates. These activities include daily living skills, productivity, and leisure interests. Activities are all viewed within the context of the environment which includes not only the physical environment, but also the social, cultural, and political settings. The following models provide the information necessary for the designer to understand the person. This information will assist in the creation of environments that are most functional for the users. The models explicitly describe the person in a logical and ordered way that is easily translated into needs within the environment.

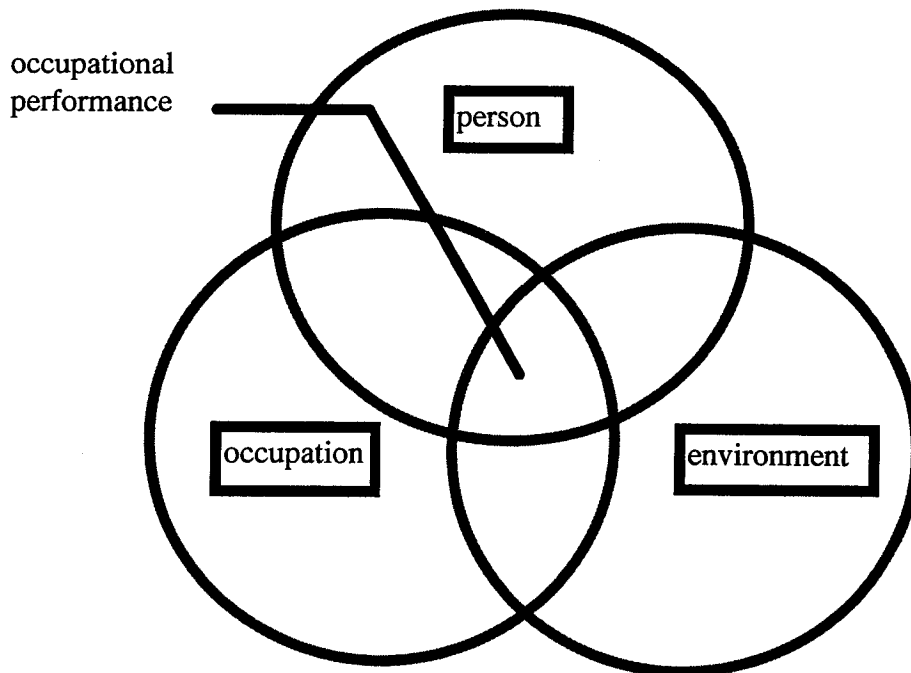
PERSON-ENVIRONMENT MODEL FOR OCCUPATIONAL PERFORMANCE

The person environment model for practice provides an application of environment behavior theory and methods of assessment and intervention for practicing occupational therapists. It is a valuable framework for the designer which facilitates an understanding of the "person" part of the person environment relationship that is often suggested or implied in environmental theory but never operationalized into a meaningful framework for practice and understanding.

Person environment relations (Law, Cooper, Stewart et al., 1994) assumes that a person is a unique being. This is a drastic shift from the paradigmatic hold that designers use regarding people (previously mentioned homogeneity). The person-environment model assumes that a person is dynamic, motivated, and is ever-developing. It operationalizes the environment as the context for occupational performance. The person functions within the environment which is broadly defined as the physical, social, cultural, institutional and economic context. The environment influences performance, is influenced by performance, and can enable or constrain performance. This person assumes different roles (parent, worker friend), possess skills or abilities (strength, cognition) and possesses attributes (culture, personality). The person strives to perform occupation or the functional tasks and activities that a person performs through their lifetime. The dynamic expression of this concept is seen as the persons occupational performance. Occupational performance is defined as complex and dynamic with temporal and spatial considerations. It is shaped by the transaction between person, environment and occupation. This concept is illustrated in figure

2.

Figure 2: Person-Environment Relations

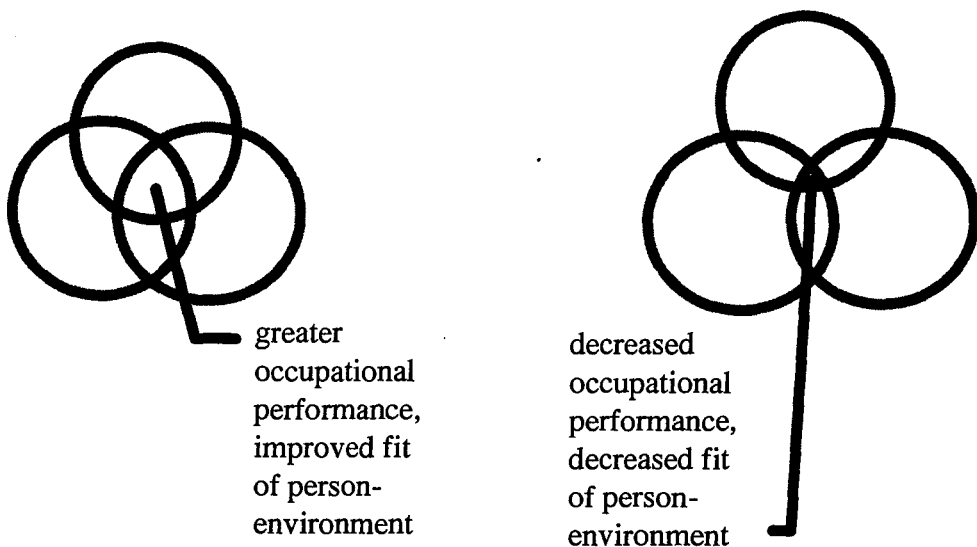


By creating environments which fit (or overlap with) the needs of the person and their roles, the person environment model suggests that the occupational performance is enhanced. When the persons skills or abilities do not fit the environment, the occupational performance suffers or fails. For example, a person who has good strength, range of motion and flexibility has the skills needed to climb a flight of stairs to reach their workplace. The environment and the person have matching abilities or skills. The result is reflected in the large overlap in the center (occupational performance). (Figure 3) The person who has limited strength, and range of motion who uses a cane to walk, has less of a fit with the environment. Although their performance is diminished, it is not absent. The person who uses a wheelchair, however, may have absent occupational performance or no overlap.

Occupational performance has observable and subjective qualities which are measurable. The performance of the person has multiple attributes which can be measured. Quality of life, performance of tasks, satisfaction with role performance are some of the methods of measuring performance. These assessment methods would be valuable in determining the effectiveness of the environments created by designers.

This model provides the user with an understanding of the individuals desired outcome or purpose. This model forms the basis of the design, as it is the outcome or performance goal which should drive the creation of the space. The details are supported by an understanding of the persons' abilities and limitations. The specific design elements can support or challenge the person, thereby facilitating the performance of the outcome goal. For example, a learning environment in which the outcome goal is stimulation and cognitive challenge will have different details and design features than a space intended to soothe an agitated client with dementia. These two examples will have significantly different use of materials, color, and use of space.

Figure 3: Examples of “fit” and “misfit” of the person and the environment.



UNIFORM TERMINOLOGY FOR OCCUPATIONAL THERAPY. American Occupational Therapy Association

I. Performance Area	II Performance Activities	III. Performance Contexts
<p>A. Activities of Daily Living: Grooming Bathing, Showering Oral Hygiene Dressing Eating Medication Health Socialization Communication Mobility Sexual Expression</p> <p>B. Work and Productivity Home Management Care of Others Educational Activity Vocational Activity</p> <p>C. Play or Leisure Exploration Performance</p>	<p>A. Sensorimotor</p> <p>1. Sensory a. Sensory Awareness b. Sensory Processing c. Perceptual Processing</p> <p>2. Neuromusculoskeletal a. Reflexes b. Range of Motion c. Muscle Tonne d. Strength e. Endurance f. Others</p> <p>3. Motor a. Coordination b. Motor control c. Dexterity d. Visual Control e. Oral Control</p> <p>B. Cognitive Skills</p> <p>1. Arousal 2. Orientation 3. Recognition 4. Attention Span 5. Mrmory 6. Sequencing 7. Concept Formation 8. Problem Solving 9. Learning</p> <p>C. Psychosocial Skills</p> <p>1. Psychological 2. Social 3. Self-Management</p>	<p>A. Temporal Aspects 1. Chronological 2. Developmental 3. Life Cycle</p> <p>B. Envrionment Aspects 1. Physical 2. Social 3. Cultural</p>

UNDERSTANDING THE “DETAILS” OF THE PERSON: UNIFORM TERMINOLOGY

To understand the Person-Environment Relations model, it is helpful to apply the American Occupational Therapy Associations Uniform Terminology. More specific than person-environment relations, this model provides descriptions of the component skills and tasks that correspond to the occupation and the person areas of person-environment relations. Figure 3.

Performance areas correspond to the occupation component of the model. These are the categories of activities carried out by humans as part of their life. They include activities of daily living, productive and leisure activities. The performance components correspond to the person area of person-environment relations. These components include those fundamental human skills and abilities that are needed for the successful completion of tasks and activities. It is the successful consideration of these skills in their composite form as they relate to the outcomes which allows an understanding of the needed environmental supports for persons.

For example, an understanding of the components or skills which are necessary to perform tasks helps the designer choose the details of the space which will facilitate function. If the user of the environment is a very young child who has lost the use of his arm, the model may be consulted to help the designer predict which aspects of the person may be affected. The designer may then apply these “person characteristics” to the person environment relations model in order to consider environmental changes which will promote occupational performance.

APPLICATION

The models provide a method of understanding the person or user of the environment. The designer is able to use the uniform terminology model to understand the various aspects or skills of the person which may require environmental support. For example, an elderly couple remodeling a home may want to create a space in which the wife who has osteoarthritis is able to maintain her cherished role of home keeper. The designer would first consult the Uniform Terminology Model to better understand the systems which would be affected by the arthritis. These would include strength, range of motion, flexibility, endurance, and fine motor dexterity. These limitations need to be considered in the context of the woman’s desired activities as they relate to her productive or work goals. These two aspects of the person are applied to the person environment-relations model. The designer then considers the environmental supports which can be provided to the woman to enhance her occupational performance. The environmental elements which would affect her performance could include simple modifications such as lever door knobs, u-shaped handles on

cupboards, a floor plan which promotes efficiency in accomplishing household tasks and other environmental modifications which would save energy and protect fragile joints. So, by using the models to first understand the skills and abilities of the person as they relate to the tasks and roles which are valuable to the person, the designer is able to efficiently choose environmental supports which promote increased occupational performance of the individual.

CONCLUSION:

These two theoretical models, when paired provide a structure and framework for viewing the person in terms of outcome goals as they function within an environment. This concept enables the designer to consider the needs of the person in terms of targeted activities (or goals within the environment) instead of looking at the impairment level or not considering the person at all.

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