Environmental Interactions:
An Extension of the Model of Occupation

(person-environment interactions, occupational behavior)

Roann Barris

Although occupational therapists historically acknowledged contributions of the environment to the maintenance of productive behavior, their literature has only recently begun to illustrate the interrelationships between persons and settings. Incorporating environmental themes into the model of occupation broadens an examination of the concept of occupational performance and helps establish the clinic as a therapeutic milieu. This paper considers three facets of person-environment interactions: environmental properties that influence the volition subsystem and the person’s decision to enter a setting; the influence of the setting’s demands for performance on the development of roles, habits, and skills; and factors affecting the individual’s engagement in an expanding range of occupational settings.

Until the late 19th century, disease was regarded as “... disharmony between the sick person and his environment ...” (1, p 102). Although this belief is deeply ingrained in the history of occupational therapy, the profession’s literature has only recently begun to incorporate environmental concepts into its own theory base. Some authors have described ways in which the environment affects behavior (2-
Choosing the Setting

The primary force lies within each child in the form of a desire to explore and come to know the larger environment. . . . [Froebel] believed that children had a desire to comprehend the extent and diversity of the world in order to better comprehend their own place within it. (9, p 336)

Personal causation, interest, and valued goals represent differentiated aspects of the individual's self-representation of desires, obligations, and ability to act in the environment (6). As components of the volition subsystem of the model of occupation—the system that chooses or enacts behavior—they collectively influence the decision to enter and interact with settings. Initially motivated by a global urge to explore and master the environment, people eventually seek greater challenges in their surroundings (6). Challenge is relative, and reflects the person's feeling that he or she is an effective cause and can exert control in an overt situation. This feeling is modulated by the individual's state of arousal.

Personal Causation and Arousal Potentials in the Environments. Arousal is determined by both the environment and the individual's past experience. Optimal arousal is generally perceived as feelings of excitement and stimulation and leads to involvement in the environment. People derive pleasure from and seek to maintain an optimal level of arousal (11). Moving to a setting that will alleviate boredom, and increasing familiarity with an unfamiliar setting are typical ways of increasing or decreasing arousal to an optimal level (12-14).

Too little or too much arousal is experienced negatively as a loss of control or a lack of opportunity to exercise one's capacity to act. Thus, the level of arousal directly contributes to the individual's decision to act and to derive pleasure from activity.

Berlyne describes three groups of environmental variables associated with arousal: 1. psychophysical variables—the intensity or quality of physical stimuli (e.g., color, sound); 2. ecological variables—or the meaning that an event has to a person's survival or well-being; and 3. collative variables—or properties deriving from processes of comparison (i.e., complexity, novelty, surprise, incongruity, and ambiguity) (10). Of these groups, the collative variables most frequently elicit investigatory behavior, through the generation of uncertainty or incongruity. Thus, a complex, novel environment will strengthen someone's urge to explore, thereby contributing to the feeling of personal causation, whereas insufficient or too much novelty and complexity will lead to boredom, anxiety, or withdrawal, and undermine personal causation.

A critical implication for treatment is that the environment must provide an optimal level of arousal for each client. When people have been institutionalized for long periods of time, the primary urge to explore may have been stifled by the sameness and routine of the hospital environment, thus contributing to a decreased sense of personal efficacy. Similarly, therapists' expectations of the severely disabled may be so reduced that they will not create a setting stimulating or challenging enough to elicit the exploratory behavior necessary to the eventual development of a sense of personal competence.

Interesting Environments. Allport describes interests as cognitively and actively linking the person to the environment (15). Extrapolating from this, Matsutsuyu proposes that interests are "choice states" in that they guide an individual's commitment to work and leisure activities (15, p 325).

The artifacts present in one's personal environment typically reflect one's interests, that is, preferences for certain art forms, music, clothes, and so on. By thus arranging environments, people maintain about themselves sufficient material stimulation for their occupational activities. In addition, persons decide to enter environments because of the interests they hold for them. A pool hall, church, library, or forest all represent different configurations of objects, people, and events corre-
responding to different interest patterns. Even finer discriminations are possible. For example, work environments have been shown to embody different types of characteristics that are attractive to different types of people (16-17). The work setting constitutes a subculture with a special language, dress code, and possible gender orientation, and the choice of a career and a place to work logically implies an interest in part or all of this subculture (18).

In hospital environments, there are usually few artifacts that correspond to the interests people have in the outside world. This lack of correlation between present opportunities and an individual's pre-existing interests may contribute to the apathy and inactivity that seem to prevail in so many psychiatric and geriatric settings; however, occupational therapy clinics typically hold the greatest potential to interest clients, and this may be critical in remotivating patients.

**Values and Environments.** Settings also exemplify different value climates. Existing values may be stable regardless of occupant turnover (19); therefore, one's affinity for the setting's dominant values will impinge upon a decision to enter and one's comfort in staying. People who perceive a large disparity between the values of the setting and their own may leave or avoid the environment. However, when they do not leave, they are prone to shift toward greater congruency with the setting's prevalent values (16, 20). Studies of the atmosphere of treatment environments have shown that patients and staff eventually come to value the attitudes or dimensions emphasized by the hospital milieu (19).

Values are communicated both explicitly and implicitly. The style of dress, relationships between staff and clients, amount of time allotted to particular activities, and the attitudes of significant people toward these activities all express certain values. In some settings, these nonverbal expressions may be incongruent with the staff's stated goals. Thus, a setting may claim to value patient independence while providing all patients with the same rigid daily schedule, or by not allowing them to take extra time to feed or dress themselves independently. Inconsistencies between values and goals, or between values and communicated expectations, will contribute to poor performance or nonperformance, or cause a high level of discomfort.

**The Importance of Interaction Between Volition and the Environment.** Because the volition subsystem is the highest in the model of occupation, it serves to organize the system's entire output (5). Thus, it is crucial that it be involved in the process of choosing a setting. What can happen when it is not involved is illustrated by a study of 182 relocated geriatric residents who were transferred to various locations following the closing of their nursing home. "One year after relocation, 52% of the residents had died . . . ." compared with a 19 percent annual death rate over the previous 10 years (21, p 145). In contrast are studies showing that groups given a chance to visit and discuss their prospective environments—and thus enhance their perception of choice and control—have a lower relocation mortality rate than groups not given this preparation (21).

Other examples of involuntary change in settings exist. Chronic schizophrenic patients who are "deinstitutionalized" to board-and-care homes and traumatic accident victims who suddenly find themselves facing a long future in rehabilitation settings are just two examples of situations in which occupational therapists may be working with clients who have been denied the choice of setting.

In summary, choosing a setting involves resolution between the volition subsystem and the environment. Arousal is a form of resolution between the urge to explore and feel control, and the novelty and complexity of the setting. The possibility of engaging in enjoyable behavior or fulfilling goals reflects resolution between the person's interests and values, and the environment. The next section will examine the interactions that influence the development of competent occupational performance.

**Interacting with the Setting**

Another subsystem of the model of occupation, habitation, allows the individual to organize behavior into routines that are consistent with social and task requirements. Skills and rules for skill use are the components of the third subsystem, performance. These components are eventually assimilated by the other two subsystems—volition and habitation—to produce occupational behavior (5). Although the volition subsystem will reflect the interactions that occur after the individual has entered a new setting, the habitation and performance subsystems are more crucially involved during the period of occupancy.

Again, relocation provides natural opportunities for observing the ways in which a newcomer experiences and interacts with an unfamiliar environment, as in the following example:

**In examining environments for those institutionalized, a most interesting finding was the experience of the Napa State Hospital of Cali-**
fornia, whose buildings were heavily damaged by the 1906 earthquake. The patients were moved into tents, and it is reported that their behavior and cooperation improved, and even epileptics were given fewer fits . . . . Tent care ended with the reconstruction of the solid brick buildings. Behavior of patients and staff returned to normal—that is, with less cooperation and more epileptic fits, presumably at the level of expected standards of behavior of mental hospital patients. (22, p. 241)

Although extreme, this incident highlights the substantial influence exerted by the physical and psycho-social environment on the roles, habits, and skills that people demonstrate.

Press, or Environmental Demands. Barker and Wright initially proposed the concept of the behavior setting in order to examine the mutual influence of the environment and its inhabitants (23). The behavior setting delineates a milieu, as well as a pattern of behavior familiar to that milieu. The behavior pattern is encouraged by the pre-existing physical and fabricated environment and is recognizable regardless of the particular individuals involved at a certain time. For instance, a tennis court and a woodshop are behavior settings, with tennis and woodworking their expected behavior patterns. However, while it is improbable that a game of baseball would occur on a tennis court or ceramics in a woodshop, enactment of the expected behavior presuming that the setting occupies understand and accept the meaning and uses of the setting and the objects that belong to it. Thus, people who enter a setting are expected to conform to certain socialized standards of what is proper or usual for that setting. If their behavior does not conform, they are likely either to change or to be evicted (24-25). This expectation, or unspoken demand for a certain behavior, has been called press (21), and is illustrated in the following scene:

... Dinah looked around at the narrow, dreary room and longed momentarily for the hygienic surroundings of a Wendy's or McDonald's, but she would have found the unaltering cleanliness and cheer even more oppressive than this glum atmosphere which bordered on squalor. Some places make demands on their patrons by their very nature—Bloomingdale's expects more than Macy's. McDonald's would demand infinitely more from Dinah than Snow's, which, she realized, required no effort of any kind. (26, p. 185)

Press may be made to varying degrees, so that one setting may have a strong press for competitiveness, whereas another may have a weak press for competitive behavior and a stronger press for creativity. A medical clinic with large, complex equipment conveys a press for passive and submissive behavior. A crafts shop, on the other hand, with materials and products informally displayed, invites participation. Arranging supplies in carefully prepared, individual packets creates a press for solitary work, while placing supplies in the middle of a table creates a press for sharing. Because press describes pervasive forces in the environment, it has potential to affect all three subsystems of occupational behavior. Its predominant impact, however, is felt by the habituation subsystem, either indirectly through demands for certain skills, or directly by affecting the individual's ability and schema for organizing skills into habits and roles.

The interaction between press and behavior is not linear. Because press is related to both the individual's objective competence and subjective perception of environmental demands, people will perceive different levels of press in the same environment. Further, there is an optimal level of press for each person. Inadequate behavior results from too little or too much (21, 27, 28). Increasing an individual's competence in an environment with limited opportunities may actually have a negative effect on that person, for, as competence increases, the press will be too low to support the new behavior (28).

Just as arousal is the match between volition and environment, press is the match between environmental demands for performance and the system's ability to perform. Arousal tells us how likely a person is to attempt a performance; press tells us what the person is required to do and how likely he or she is to succeed.

The concept of press, or environmental demands for performance, also permits different interpretations of "pathological" behavior. For juvenile delinquents, for instance, the environmental press for productive social and work behavior may be too high for their skill level, thus causing their behavior to become maladaptive.

Although press has an intangible aura to it, the density of people in a setting is a very concrete characteristic with significant implications for role, habit, and skill development. Density contributes to press, but it can be profitably viewed as a separate characteristic.

Population Density and Performance. Because the population of a setting needs to be considered in relation to the number of functions or tasks being fulfilled by it, a theory
of "manning" levels has been pro-
posed and applied to diverse settings
(24, 29). According to this theory,
three conditions can exist in a set-
ting: 1. undermanned, or fewer
people than is necessary to carry out
normal group activities; 2. over-
manned, or more people than can
be accommodated by the tasks; and
3. adequately manned.

Research examining the effects of
overmanning and undermanning
has generally indicated that indi-
vidual responsibility and satisfac-
tion are inversely correlated with
the level of manning (30). Individuals
participate in more activities in un-
dermanned environments and have
more opportunities to fill leader-
ship roles and develop competence
in a wide range of skills (31). In a
study of psychiatric hospital wards
(32), it was observed that conditions
of undermanning and overmanning
simultaneously existed. The nurs-
ing staff was undermanned for the
number of activities associated with
them, whereas the patients were
overmanned. Further, nursing ac-
tivities were considered to be "es-
sential" and patient activities were
not. Because of the high ratio of
patients to relatively unimportant
activities, patients felt very little
performance pressure, and were
consequently—and counter-thera-
petically—learning or strengthen-
ing a passive-outsider role.

Also of special significance for
patients (and "potential" patients)
is the finding that in underpopu-
lated settings people with marginal
skills may be more readily drawn in
because of a lack of more qualified
participants, whereas in crowded
settings they will more readily be-
come extraneous (31). A similar sit-
uation may be encountered in activ-
ity groups when the role of leader is
filled by the therapist. This inad-
vertently contributes to patients'
feelings of marginality by leaving
them less important roles to fill. The
implication is not that the size of a
group will affect the type or quality
of performance, but that the number
and importance of opportunities
available to each person will.

Objects in the Environment. Nonhuman objects contained within
a setting contribute to its poten-
tial attractiveness to the individual
in addition to mediating behavior
after he or she has occupied the set-
ting. In a direct manner, an indi-
vidual's performance may be con-
strained by the inaccessibility (or
overabundance) of certain mate-
rials, whereas alternative behaviors
may be induced by the same
conditions.

An observational study of chil-
dren in variously equipped play-
grounds found that when play ob-
jects were removed, children
consistently engaged in more play
with permanent materials (sand and
dirt), more sedentary activity, more
games, more social contacts, and
more "undesirable" behaviors (cry-
ing, teasing). The addition of
equipment led to less game playing,
less undesirable behavior, and less
use of permanent materials, but
more physical activity and use of
the new materials (33). This sug-
gests that social playing habits may
be discouraged by too many play
objects; however, because objects
also carry with them certain use ex-
pectations, the relationship between
social play and play materials is in-
fluenced by the type of materials
chosen.

Quilitch and Risley classified toys
as being either "social" (played with
by two to four children at a time) or
"isolate" (used by one child at a
time) (34, p. 547), and then observed
that children's play predictably re-
sponded to the types of toys given
them: "... extreme differences in
social play were seen that depended

The American Journal of Occupational Therapy
not upon the children or adults' interactions with them, but simply upon which toys were provided to them for play." (34, p 567)

The mediating effects of objects may also arise from interactions with other people's abilities to use or manipulate them—an abundance of objects will not necessarily lead to their use (35). The availability, skills, and attitudes of other people thus become integral components of accessible objects. In the following quotation, a comparison of natural and artificial environments points to the significance of adult interaction with available play objects:

Margaret Mead has shown that Manus children make little use of their natural environment for lack of adult guidance; they romp like puppies. On the other hand, John Holt has shown how, under adult guidance, a typewriter can fascinate and reward children, even infants. (36, p 18)

That outside intervention encourages use raises the question of whether or not the kind of feedback inherent in particular materials is consistent with other expectations in the environment (37). In the treatment setting, feedback may be wholly dependent upon the therapist: for instance, a blood test must be interpreted by a doctor. In other activities, however, feedback unfolds from continued use and exploration, for example, using a mobile arm support to learn to feed oneself. If clients are expected to assume or share responsibility for treatment, then treatment should not entail a passive response to objects controlled by the therapist.

This section has highlighted the interactions that occur during occupancy of a setting. Features of the environment such as press, density, and the availability of objects and their associated properties may contribute to the setting's initial attractiveness, but they exert a greater impact on occupational performance through the system's feedback loop by transmitting certain expectations for performance, and by constraining or enhancing the individual's ability to develop skills and to organize them into productive habits and roles. Figure 1 illustrates the ongoing interaction between the human system and the environment throughout the process of choosing and occupying settings.

The Trajectory of Increasing Occupancy
Development is a process of becoming effective in a greater number of increasingly complex settings (38). If individuals do not learn how to produce relevant role behavior in the settings they have entered, they will be inadequately prepared for future settings. Thus, the relationship among age, cultural expectations, the individual's competence, and the number of settings that are open and attractive to that person, as well as the extent of similarities between these settings, will contribute to the ontogenesis of occupational performance.

In much the same way that the temporal relationship between the balance of work and play changes throughout the life span (6), so, too, do the occupational settings in which the person participates or is expected to participate. This change occurs in both the general type of setting (work, play, home) and the differentiation within each type (playpen, living room, front porch, playground). Most Americans expect to go to school, to work part- or full-time in late adolescence, and to continue working throughout...
adolescence. Some people expect to spend time in religious settings. To some extent, then, occupancy of settings is culturally and age determined. Figure 2 offers a hypothetical illustration of the relationship between age and the dominance of particular settings, based on the work of Barker and Wright (23).

The phenomenon of increasing occupancy of settings also parallels and responds to the person's development in other spheres at the same time that it contributes to further growth and learning (39). For instance, the "habitual range" of a young child consists of places around and close to home, because of parental, geographic, and temporal restrictions (39). A child who has learned to ride a bike is allowed to travel independently greater distances from home. Increased physical competence enables the child to develop spatial comprehension, to assume responsibility for matters such as being home on time, to become friendly with children who do not live on the immediate block, and so on. Each added skill expands the settings the child can travel to and occupy independently.

Competence, then, is an important factor in the occupation of settings. As individuals master the performance necessary for one setting, they will seek new settings in order to apply and transfer previously learned behavior and in order to increase their repertoire of competent behavior. However, a change in the physical or mental status of a person may change the settings open to him or her. This individual, although competent in certain spheres of life, may not be able to produce relevant behaviors for the new settings, or may no longer be competent in old settings. Occupational behavior must therefore be looked at in relation to the totality of settings that will be, or should be, entered by an individual.

Development cannot be assumed solely because someone is involved in a number of settings; one must also consider the similarity of settings to understand the range of skills and milieu the individual is learning to negotiate. Settings can be judged similar or dissimilar in terms of their participants, location, leaders, available objects, and the activities and behaviors stressed (23). Similarity between settings will facilitate the transfer of behavior. Conversely, if dissimilarity between occupied settings is limited, then the opportunity for new and unpredictable experiences, and the consequent learning of new behavior, decreases (23). In the latter situation, the individual may not only develop a rigid repertoire of skills and habits, but may also excessively fear unfamiliar settings. Observations of differences in the reactions of long-term hospitalized children and nonhospitalized children to playing in unfamiliar settings illustrate this. Although both groups approach the new setting with hesitancy, the latter overcome this and explore the unfamiliar playroom more quickly than the children who have been living in the hospital.

Very often the treatment clinic is the only place where the client is routinely expected to exhibit competence, despite awareness of the gaps between the clinic and the multitude of community settings that will be entered by the client. The press for types of performance conveyed by community settings may be quite different from the demands of the clinic. In addition, institutional settings are highly independent in terms of people entering them, materials available, and expected behaviors. This interdependency makes it relatively easy to act consistently from one setting to the next—or conversely, relatively difficult to change. Outside the hospital, settings are less likely to be interdependent. The implication is that treatment must include assessment of the many settings that will be entered by the client, as well as the client's ability to perform in these settings.

Summary and Conclusion

To summarize, the process of choosing and occupying settings is based on continuing resonance between the human system and the environment. Initially, an individual's urge to explore motivates the search for settings that are attractive because of their novelty or compatibility with the person's values and interests. In the setting, the person's behavior reflects the interactions between his or her habituation and performance subsystems and various properties of the environment—press, density of population, availability of objects, and expectations associated with their use. The development of competent performance, cultural and age expectations, and similarity or differences between settings will interact to influence the person's occupational performance in an increased range of settings.

This paper incorporated environmental literature into an existing model for occupational therapy. The individual's relationship to the environment was examined in three areas: 1. environmental properties that foster a sense of personal causation and the development of interests and values; 2. the way in which the environment communicates performance expectations and their impact on the development of roles, habits, and skills; and 3. factors affecting the individual's participation in additional settings. Thus,
one can begin to ask questions relating to each phase of interaction between the human system and the environment. For example, to what extent do arousal, interests, and valued goals contribute independently and interactively to the person's decision to enter a setting? What values are communicated by occupational therapy clinics in different treatment environments? How can therapists deliberately create undemanding settings for patients in large institutions? Who controls feedback in different therapeutic activities—therapist or client? Can occupational settings be characterized by level and type of competencies demanded?

In addition to deepening our understanding of the development of competent performance, reemphasizing the role of the environment enables students and therapists to be more attuned to the contexts of treatment. Ultimately, occupational therapists will realize the potential of the clinic as a therapeutic milieu to help clients reestablish harmony with the environment.

Acknowledgments
I am indebted to Dr. J. Grannis, for introducing me to and interesting me in human ecology, and to Dr. Gary Kielhofner, both for writing papers that made occupational therapy make sense to me, and for his patient and persistent encouragement.

REFERENCES