Occupational Science: Academic Innovation in the Service of Occupational Therapy’s Future

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Key Words: education, occupational therapy

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This article was accepted for publication September 15, 1990.

OCCUPATIONAL SCIENCE: A NEW SCIENTIFIC DISCIPLINE

Occupational science is a new scientific discipline that is defined as the systematic study of the human as an occupational being. A doctoral program in occupational science has been established at the University of Southern California, Los Angeles. With its emphasis on the provision of a multidimensional description of the substrates, form, function, meaning, and sociocultural and historical contexts of occupation, occupational science emphasizes the ability of humans throughout the life span to actively pursue and orchestrate occupations. In this paper, occupational science is described, defined, and distinguished from other social sciences. A general systems model is presented as a heuristic to explain occupation and organize knowledge in occupational science. The development of occupational science offers several key benefits to the profession of occupational therapy, including (a) fulfillment of the demand for doctoral-level faculty members in colleges and universities; (b) the generation of needed basic science research; and (c) the justification for and potential enhancement of practice.

J. Seward Johnson, Jr. (1987), known for creating ultrarealistic bronze sculptures of persons participating in everyday activities, such as fishing or reading a newspaper, has said of his work, "I looked over the body of my work, and found a common strain. In each case, I celebrated a moment when the individual had taken control of his or her life... I want my people to be unheroic, and in so being, become universal. But I want their act that I am celebrating, the existential gesture, to be heroic in the lowest key" (p. 29). Just as Johnson celebrated the familiar through the creation of works of art, occupational therapy honors the power of ordinary experiences within the context of health care. We have come to call the ordinary and familiar things that people do every day occupations, and we believe that humans are most true to their humanity when they are engaged in occupations (Yerxa et al., in press). The scientific discipline that provides explanations of the human as an occupational being is occupational science (University of Southern California [USC], Department of Occupational Therapy, 1989).

What is it about occupation that makes it so uniquely human? Some of us can recall our patients' faces as they focused their attention on the operation of a floor loom. We can remember them visualizing the final product as they selected yarn. We see their hands deftly weaving and we recall the sustained glow of accomplishment when they examined the final product of their efforts. Others of us remember the sense of pride that our recovering alcoholic patients displayed as they reported to us that instead of having to take a drink to escape their fears and loneliness, they were able to achieve peace and relaxation by going fishing with some buddies, where the soothing sounds of cascading water and the timeless presence of ancient trees provided them with a fresh outlook on life.
To them, occupation takes the form of an antidote to psychological pain. Still others of us can remember our elderly patients who, after having open-heart surgery, expressed that they were finally getting back themselves, as they became progressively independent in caring for themselves. For them, occupation entails a struggle to reconstruct a more dignified life. In our practice, we have maintained that what our patients do really matters—it influences their health, their self-respect, and their sense of dignity. But we have also declared that it is not so much what they do that is critical as is the acknowledgment that occupation is always pregnant with meaning. Occupation is a uniquely human enterprise because of the extent of its symbolic vehicle.

Unlike occupational therapists who have traditionally been fascinated with what is at the heart of human enterprise and activity, mainstream social science has not focused on this question. Thus, we are left with an abundance of questions about occupation that must be answered so that the practice of occupational therapy can be nurtured. We must begin to construct theories that elucidate the reasons why persons choose one activity over another (Harre, Clarke, & De Carlo, 1985), and we must delve into persons’ life histories to gain a sense of the complexity of factors that ultimately influence how one decides to live one’s life in relation to work, rest, leisure, and play. Why would a person choose to live in a particular home on the basis of the availability of a tennis court? Why would a young girl in Taiwan, where few opportunities for a ballet dancer exist, choose to devote her life to a career in ballet, when so many others quit after several years of investment? Why do certain persons derive an overwhelming sense of peace from activities such as gardening or fishing, and to what extent are occupations dependent on specific ecological systems or environments? For example, if fish virtually disappear from our streams, forests are eliminated, rivers and lakes become toxic, and air pollution is constantly at an unsafe level, will humans adapt by replacing fishing, hiking, swimming, and jogging with occupations that do not require a natural environment, or might artificial environments (such as swimming pools) be fabricated in which to do these time-tested occupations? Once the place and potency of occupation in our daily lives is understood through systematic study, the practice of occupational therapy may be enhanced.

In the present paper, we describe the emerging discipline of occupational science, its relation to other disciplines, examples of research that fall within its boundaries, and the potential contribution it can make to society. Finally, we illustrate the ways in which occupational science can contribute to several realms of practice to confront contemporary social and health problems. Ultimately, we conclude that occupational science will allow the profession of occupational therapy to take its place while preserving its identity.

**Definition and Basic Characteristics**

As already stated, occupational science is defined as the study of humans as occupational beings (Yerxa et al., in press). Some of us may cringe at this definition, for we have come to respond negatively to any definition that uses the term *occupation* or any of its derivatives. We are tired of trying to describe what occupational therapists do, of seeing one article after another extolling the virtues of occupation (whatever it is), and of hearing lectures that promise once and for all to clarify the meaning of the term occupation. Some of us, in fact, think that if we could just delete the word *occupational* from the name of the profession, we would be far better off. To one in this frame of mind, our claim about an emerging occupational science may seem at best just another occupational nightmare.

In the conceptualization of occupational science, however, an attempt was made to develop a jargon-free definition of occupation that is easily accessible and that can create a unified vision of what is at the very heart of our practice. We define occupation, simply, as chunks of culturally and personally meaningful activity in which humans engage that can be named in the lexicon of our culture (USC, Department of Occupational Therapy, 1989). Activities such as dressing, attending a party, gardening, watching television, making love, and preparing a meal are occupations. Our use of the term occupation is thus conceived generally and not in the conventional sense of a career or job, nor does it only include activities that meet productivity needs. Many occupations are engaged in simply for pleasure (Ornstein & Sobel, 1989). Occupations can be construed at an abstract level, as in working, resting, or engaging in leisure activities, or more concretely, as in reading a book, playing tennis, or painting a house.

Humans are not preprogrammed to engage in a planned round of activities. Each day they make decisions about what to do and what not to do. Thus, within the course of a day, they configure activities within time that can be chunked and correspondingly labeled. For example, in the morning, a person may awaken, then groom, then eat, and then jog or may construct another variation of such a sequence. Thus, each day, the person creates his or her daily experiences through planning, orchestrating, and participating in occupations (Yerxa et al., in press). The potential ramifications of this orchestration with respect to health, adaptation, and sense of well-being are immense. Research has demonstrated, for example, that mundane, everyday experiences affect psychological well-being to a greater extent than do major life events (Kanner, Coyne, Schaefer, & Lazarus, 1981; Monroe, 1983) and can be enormously health-promoting (Ornstein & Sobel, 1989). The net effect of this enterprise is the perception of the quality of our experiences.

Unlike the activities of animals, occupations require self-awareness, the ability to recall and project events, and
the ability to elaborate personal and cultural meanings. Whereas animals procure food, pursue interesting stimuli, and engage in rudimentary activity, such activity is enslaved in the present and is limited in its symbolic content. We therefore refer to the activities of animals as *proto-occupations*, while recognizing that their activities are no less important to them than ours are to us. The major point of distinction rests in the extent to which the activities carry a symbolic vehicle. To illustrate this point, occupation in the postmodern world requires that it be orchestrated in appointment books and calendars, tools not needed by nonhuman species for their adaptation. Nor do we suppose that animals are haunted by thoughts of the meaning and the ultimate significance of their investment in particular occupations. When we attempt to explain occupation simply as an activity unsaturated with meaning, we miss its essence.

Because the focus of occupational science is on the multidimensional nature of occupation, satisfactory explanations of it must surpass the discovery of simple causal chains between variables. In describing the fundamental requirements for a psychology of action, Harre et al. (1985) argued that it is critical to study "the reasons for action" as well as the "causes of behavior" (p. 17). Similarly, we believe that in generating theory about occupation, we must examine the rules, moral convictions, symbolic meanings, emotional responses, and sociocultural and historical contexts that influence one's decision about whether to invest one's energy in particular occupations. Occupational science, however, must also include studies on the neurobiological substrates of skills and occupation, such as those of eye-hand coordination or praxis.

Thus, we believe that occupational science must address minimally the substrates, form, function, meaning, and sociocultural and historical contexts of occupations. This requires a multidimensional perspective. The complexity of the knowledge generated is anticipated to lend itself to organization through the principles of general systems theory (von Bertalanffy, 1968). Phenomena of interaction occupation is designated in the model as the output of the system. Clearly, occupations either facilitate or limit the capacity of the person for successful adaptation to environmental demands.

The model, which is shown in Figure 1, presents the human system as comprising six levels (subsystems), which are presumed to be critical for the understanding of occupation. These six subsystems are discussed below. Although tentative, the selection of these six subsystems is grounded in a long history of seminal works by Boulding (1956), Reilly (1974), and von Bertalanffy (1968).

*The Physical Subsystem*

This level encompasses phenomena that can be appropriately described by physicochemical processes. For example, anatomic subsystems such as those of muscles and neural synapses are explained in this level. Of interest here is the support that physical systems provide to the enactment of occupations. For example, explanations of the physical mechanics that contribute to skilled use of the hands constitute theory falling within the conceptual boundaries of occupational science at this level.

*The Biological Subsystem*

This subsystem is distinct from the physical in that it comprises living systems that directly relate to biological adaptation (von Bertalanffy, 1968). Phenomena of inter-

The USC Model of the Human Subsystems That Influence Occupation: An Organizing Heuristic

The faculty of the USC Department of Occupational Therapy has developed the USC Model of Human Subsystems That Influence Occupation to provide a coherent conceptual framework for the organization of knowledge generated in occupational science and to illustrate the human subsystems in order to provide a comprehensive explanation of occupation (USC, Department of Occupational Therapy, 1989). It is important to note that this model, as such, is not construed as a final solution to the concerns of occupational science.

The model, which employs general systems theory, depicts the human as an occupational being. Presented as a hierarchically arranged set of concrete and abstract subsystems, the person is seen as an open system in interaction with his or her environment over the entire life span, from birth to old age. Use of a systems model to explain developmental changes in occupation is consistent with the work of Sameroff (1982), a developmental psychologist at Brown University, Providence, Rhode Island, who advocated the application of general systems principles to the analysis of developmental processes.

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The University of Southern California Model of the Human Subsystems That Influence Occupation.
est at this level include the biological drive for competence, the contributions of sensory integration to purposive and exploratory behaviors. Theoretic discourse generated at this level is expected to explain the biologically programmed aspects of occupation. For example, studies of primate play may reveal a biological basis for the seeking out of vestibular stimulation.

The Information Processing Subsystem
This subsystem deals with the cognitive operations that are used by humans to organize behavior (Miller & Miller, 1985). Phenomena addressed include perceptual and conceptual functions, learning, memory, and planning as they shape engagement in occupation. An example of knowledge already developed at this level is Reilly’s (1974) work on the concept of rules in relation to skill acquisition and habit formation.

The Sociocultural Subsystem
This subsystem focuses on the person’s perceptions of social and cultural expectations for occupational behavior. Occupations are enacted in social contexts; thus, social and cultural standards structure occupational roles (Parker, 1977). Knowledge development in the area of role enactment, expectations, and perceptions; their interrelationships; and the effect they have on occupational behavior are subsumed within this level. Lever’s (1978) work on the relationship of participation in childhood games to the development of strategies for sex-role performance represents research at this level.

The Symbolic–Evaluative Subsystem
This level addresses the social systems used in the personal assessment of the value of an occupation. Examples of such systems include “language, logic, mathematics, sciences, arts and morals” (von Bertalanffy, 1968, p. 29). The content and meaning of communication, the complexity of value systems, and the transcription of images into historical documents as well as the symbolic meaning of art, music, poetry, and human emotion are represented (Boulding, 1956). In the model, this level is included because of the contribution symbol systems can potentially make to an explanation of occupation, particularly insofar as they inform choices of action or influence the degree of significance conferred on selected occupations.

The Transcendental Subsystem
This subsystem is concerned with the meaning the person ascribes to his or her life experiences and the will that impels him or her through life. The word *transcendence* is used here to connote “one’s relation to, or purposive direction into the future in accordance with ideas, emotions, hope, preparation, goals” (Angeles, 1981, p. 296). A sense of life satisfaction, purpose, and quality of life is seen as the net result of engagement in carefully orchestrated occupation.

Summary of the Model’s Characteristics
Some assumptions of this model are (a) that occupation cannot be explained through the focus on a single level (subsystem) of the human system; (b) that occupation must be studied within the context of both the immediate environment and the person’s history; (c) that occupation is fired by the human system’s drive for efficacy and competency; (d) that although it may be observed as a behavior, occupation cannot be fully understood without consideration of its significance to the individual (for example, eating for survival vs. eating as a respite from work); and (e) that the most productive study of occupation requires a synthesis of knowledge from the biological and social sciences.

We are interested in how occupation is founded in a person’s genetic inheritance; in his or her unique patterns of skills, interests, and abilities; and in sociocultural role expectations. The overriding issue of meaning is concerned with the ultimate valuing of what one does with one’s time, resources, and skills.

Several features of the model are noteworthy. First, it presents a view of the human that is unique to occupational science, that is, it emphasizes the complexity and symbolic character of occupation. Second, it circumscribes the discipline’s major theoretic constructs as well as its conceptual boundaries. Third, it is intended to prevent research endeavors from becoming fragmentary. In short, the USC Model of the Human Subsystems That Influence Occupation is a sort of blueprint from which the research activities of the faculty and students flow and through which the findings generated are organized into a unified corpus of knowledge.

Examples of potential research topics in occupational science are (a) the manner in which one’s organization of time changes from childhood to adulthood to retirement; (b) the contribution of childhood occupations to adult competency and achievement motivation; (c) the relationship of work and leisure to health, happiness, and quality of life; (d) the manner by which the shared occupations of mothers and their children affect adaptive skill development of the child; (e) an exploration of what constitutes a healthful balance of work, rest, and leisure within the daily round of occupations; (f) the ways in which cultural differences in the customary round of activities of children shape their adult work habits; and (g) the description of the rules, moral convictions, and other symbolic systems that guide one’s choice of occupation.

The Relation of Occupational Science to Other Disciplines
The question of whether occupational science constitutes a new and unique discipline must be addressed. Occupa-
tional science is inherently interdisciplinary. Because occupations commonly engage people in multiple ways (e.g., dancing appears to involve a person physically, psychologically, and socially), theoretical concepts from outside disciplines such as biology, developmental and social psychology, and anthropology may contribute to a fully orbited understanding of occupation. Nonetheless, we argue that occupational science constitutes a conceptually distinct field of inquiry with its own subject matter and emphases.

The issue of academic boundaries is not unique to occupational science; indeed, it has been the subject of ongoing discourse in the social sciences. Psychology, for example, has been defined as the science of human experience and behavior, both overt and covert (Chaplin, 1985). The broadness of such a definition could easily be construed as subsuming anthropology and sociology. In his pioneering work, Tylor (1871/1959) characterized anthropology's science of culture as concerned with "that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society" (p. 3). Despite the all-encompassing quality of this definition, anthropology has a well-established place as a distinct discipline today. Wilson (1966) defined sociology as the study of patterns in human relationships and stated that its distinction from anthropology is a matter of tradition and emphasis rather than logic. Similarly, occupational science is distinctive in its tradition and emphasis. The unique traditional base lies in the practice of occupational therapy, with its concern with the adaptation, by way of engagement in occupation, of persons with disabilities (Bing, 1986; Yerxa, 1987). Occupational science is distinct in that it attempts theoretically to address the entire range of phenomena surrounding human occupation. This goal requires the conceptual synthesis of physical, biological, psychological, sociocultural, and symbolic considerations, and thus demands a novel, systematic approach that consciously seeks to arrive at complex models of occupation, such as that which would be produced through the use of the general systems theory. This multidimensional emphasis, in conjunction with a view of the human as an active orchestrator of his or her occupations as a means of confronting life's challenges, distinguishes occupational science as a unique and important sphere of inquiry. In short, occupational science acknowledges the critical role that values, vision, imagination, reflection, and emotion play in decisions about what to do each day and how to do it. It regards the human as a conscious, active agent who dynamically interacts in specific socio-cultural and historical contexts.

Although traditional disciplines occasionally address issues related to particular occupations, such efforts typically are theoretically circumscribed and interpretively construed within the traditional framework of the discipline in question. For example, the potential effect of television viewing on both interpersonal aggression (see, for example, Feshbach & Singer, 1971; Leyens, Camino, Parke, & Berkowitz, 1975) and sex-role behavior (see, for example, McArthur & Eisen, 1976; Walstedt, Geis, & Brown, 1980) has received attention within social psychology. Although this research addresses a prominent occupation (i.e., watching television), the approach that is taken reflects disciplinary emphases that direct attention away from many of the key processes involved. For example, the television viewer is generally regarded as a passive recipient of external stimulation and not as an agent who chooses to engage in this occupation. Additionally, social psychological analyses emphasize the direct effect of specific types of television content (viz., the portrayal of violence as well as of sex-role stereotypes) on corresponding, specific social-interactional response domains that have traditionally received attention within the discipline. The result is that the influence of television viewing on the viewers' emotional state, as well as its long-term ramifications for achievement motivation, for the ability to initiate and derive pleasure from less passive occupations (e.g., making a ceramic pot or gardening), and on moral decisions is ignored. This example underscores the need for systems thinking in guiding research that is explicitly organized around the concept of occupation.

In addition to expanding and systematizing knowledge about occupations that has received attention within existing fields, occupational science, because of its unique content focus, addresses important topics that have been largely ignored by the traditional disciplines. Examples of such research foci, some of which have already been tackled by scholars in our profession, include the influence of childhood play on the sense of competence, resourcefulness, and coping in adulthood (Reilly, 1974); the optimal balance of work, rest, and leisure at different stages of the life span; and the development of praxis, defined as an intelligence of doing (Ayres, 1985) that enables one to effectively mediate transactions in the physical–spatial world.

Occupational science, therefore, does not belong under the aegis of other disciplines because it has a unique focus that is not investigated directly by scholars in other fields. Although occupational science can profit from knowledge contributed by other fields, its pressing questions are not formulated in a coherent manner within the research programs of other disciplines. Because occupational science involves a synthesis across disciplines, compartmentalization under one of the contributing disciplines would stifle the investigation of the full range of concerns relevant to the study of occupation. A well-established knowledge base specific to occupation is highly unlikely to emerge unless research efforts are explicitly directed toward the study of occupation as a uniquely human, symbolic enterprise.

To summarize this section, much of the gamut of
human functioning and behavior is linked to occupation, yet the concept of occupation as an organizer of theory and research falls outside the domain of traditional disciplines. This idea provided strong justification for the development of occupational science as a scholarly enterprise.

**Evidence of a Legitimate Scholarly Discipline**

Scholars are increasingly recognizing the central role of occupations in enabling human adaptation. The conceptualization of occupational science presented in the present paper is similar to work being done by faculty both within and outside the discipline of occupational therapy. Some of these works are listed below; this list, however, is by no means exhaustive.

At the USC Department of Occupational Therapy, scholarly contributions by Mary Reilly, Emeritus Professor (Reilly, 1962, 1974), and Jean Ayres (deceased), Emeritus Associate Professor (Ayres, 1963, 1972, 1979), led to increased understanding of play, work, and skill attainment. The philosophical assumptions underlying occupational science were elucidated by Emeritus Professor Elizabeth J. Yerxa (1988). Currently, USC faculty are further extending occupational science. The first and second authors, continuing in the tradition of Ayres, have been studying the construct of praxis (Clark, Parham, Mailloux, & Fanchang, 1983; Parham, 1989). The eighth author and colleagues (Iherall, Preti, & Zemke, 1989) have been investigating the moderating effect that sense of purpose has on eye-hand coordination. The fourth author (Frank, 1984, 1988) does intense ethnographies of the interplay of sociocultural context and biographical construction on the life adaptation of persons with chronic disability. Allen (1987, 1990) has examined the cross-cultural and cross-species similarities in information processing during occupations and proto-occupations. Neville-Jan (1986) has been studying the relationship between personality variables, such as locus of control, on adaptive behaviors in patients with depression, while Fazio (1988) has investigated the importance of sexuality in the occupational index of the well elderly. In her effort to develop a theory of infant object-rule acquisition, the sixth author (Pierce, 1988) is forging a groundwork for understanding adult uses of objects as tools, as aesthetic statements, or as environments. Recently, the fifth author (Jackson, 1989) received a grant to study the patterns of and emotional response to daily occupations of adolescents with disabilities.

Work in occupational science is also being done in other occupational therapy departments in the United States. Kielhofner, at the University of Illinois, Chicago, and Burke, at Thomas Jefferson University, Philadelphia, developed and are testing a Model of Human Occupation, which views the person as an open system in interaction with the environment (Kielhofner, 1980a, 1980b; Kielhofner & Burke, 1980; Kielhofner, Burke, & Igi, 1980). Nelson, at Western Michigan University, Kalamazoo, is conducting research and developing theory in the area of occupational analysis, a study of the intrinsic qualities and meanings of occupations (Nelson, 1988; Nelson, Thompson, & Moore, 1982). Maguire, at Florida International University, Miami, is studying patterns of occupation and leisure concepts among the elderly (Maguire, 1983). Finally, Cermak and her colleagues and students (MacWhaney, Cermak, & Fisher, 1987; Magalhaes, Koomar, & Cermak, 1989) at Boston University have been doing extensive work on the praxis and body image constructs and on bilateral coordination as substrates of skilled motor performance in children.

In other disciplines, researchers are developing knowledge of relevance to occupational science. Work already generated on emotional responses to participation in occupation (Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988; Csikszentmihalyi & Larson, 1984), on time (Berk & Berk, 1979; Gross, 1984; Robinson, 1977), and on action (Ginsberg, Brenner, & von Cranach, 1985; Harre et al., 1985) are examples.

Although occupational science directs attention to the ways that persons adapt over the life span through the orchestration of occupations, it is recognized that occupational behavior occurs in social contexts. Thus, research identifying the structures and processes of social organization, including the political economy, provide a necessary framework for the understanding of occupations and may be considered in this light as of great relevance to occupational science. The point becomes clearer with historical examples that relate to the cultural definition and social organization of health and health care.

Bell's book, *Holy Anorexia* (1985), suggests how, in the medieval period, a preponderance of holy women recognized by the Roman Catholic church appear to have been anorexic. Critical dimensions seem to have been psychological (e.g., the need for autonomy) and sociocultural (e.g., the limited avenues for self-expression by women in a patriarchal social structure). Thus, anorexia can be understood not only in today's terms as a health condition related to the single occupation of feeding oneself or as a psychiatric diagnosis related to distorted body images, but as the basis for an occupational role. In medieval times, this meant the filling of an institutional niche in which roles and resources, including social status, were controlled and limited by patriarchal hierarchical organization. A rethinking of anorexia in terms of modern occupational roles for persons (mainly young women) who exhibit this disorder is suggested by an occupational science approach.

A contemporary example of this phenomenon is the way in which jobs are defined as unskilled clerical jobs or service jobs in a hospital, said to distinguish mental from manual labor. Yet, as Sack's (1988) ethnography of labor
organizing at a medical center shows, entry-level unskilled female ward clerks are expected to do an enormous amount of mental labor, coordinating multilevel medical teams without authority or recognition. Sacks shows how people at work define their activities very differently for themselves than for their employers, yet are also constrained to act in given ways; the study of such tensions in the identification and performance of occupations is within the province of occupational science.

Finally, Goodall’s (1986) recent studies of chimpanzees demonstrated the role that primatological research plays in elucidating the relevance of biological factors to occupation. Goodall’s focus is on rudimentary manifestations of occupation (protooccupations) as expressed in such activities as feeding, grooming, and tool use. In addition to their direct outcomes, these activities have been shown to affect patterns of dominance and stability within chimpanzee society. The suggestions of Goodall’s work for occupational science are twofold: (a) that there is a biological influence on the organization of occupations among human beings and (b) that patterns of occupational behavior may have important ramifications at a sociocultural level. In her capacity as Distinguished Adjunct Professor within the USC Department of Occupational Therapy, Dr. Goodall will be directly contributing to occupational science by providing ideas on appropriate ethological methods for studying occupation and by sharing her knowledge about the proto-occupations of primates.

The Methodology of Occupational Science
A wide variety of conventional as well as new methodologies are expected to be used in occupational science. Mainstream social science methodologies such as experimentation and quasi-experimentation are optimally used to examine circumscribed research questions involving the overtly observable facets of occupation. Because of the multidimensional nature of occupations, it is expected that quantitative multivariate-causal modeling analyses may be appropriate for a wide spectrum of research problems in occupational science.

Because occupational science must address the symbolic and transcendental systems that govern the choices of occupation in specific sociocultural and historical contexts, however, methodologies that enable the uncovering of the reasons for action, such as the dramaturgical methods described by Harre et al. (1985), may be particularly useful. Existing methodologies that allow detailed description and analysis not only of the overt manifestations of occupation but also of the phenomenological experience of the doer while engaging in occupation become those most likely to prevail in occupational science. The methods used, however, will depend on the kinds of research questions asked. We expect that as the discipline progresses, new methodological strategies for the study of occupation will emerge periodically.

Potential Contributions of Occupational Science to Society
Beyond its role in promoting basic knowledge, occupational science has the potential to substantially benefit society in practical ways. First, as discussed below, the continued development of a science of occupation will generate a knowledge base capable of improving the practice profession of occupational therapy. Second, increased public knowledge of the discourse and findings in occupational science may make human lives more productive, meaningful, healthy, and satisfying.

Participation in occupations has been shown to significantly relate to multiple outcome variables such as health, self-esteem, social competence, happiness, and satisfaction with life (e.g., Reich & Zautra, 1983; Rodin & Langer, 1977; Stone, 1981, 1987). Consequently, the widespread dissemination of new information regarding such topics as the role of the immediate environment in altering the manner in which occupations influence people, the factors that lead some people, as contrasted with others, to ignore the goal of balancing work, rest, and leisure in their daily routines, and the effects of early childhood patterns of occupation on adult competence, career choice and mobility, and life satisfaction has the potential to affect countless lives in a positive way.

To contribute meaningfully to society, the scientific study of occupation must provide insights that transcend everyday knowledge. Occupational science overcomes many of the limitations of common sense in that it should afford a more critical, detailed, and systematic understanding of human occupation. Thus, for example, the commonly held assumption that a balance of work and leisure is healthful, although probably correct in a general way, fails to define work, leisure, or what constitutes a balance; does not specify the aspects of health that are promoted; and is not seriously subjected to the possibility of disconfirmation. Occupational science, because of its systems approach, can remedy each of the above omissions. Additionally, it will improve on everyday knowledge through both the study of phenomena about which commonsense assumptions do not exist and the creation of useful, novel theoretical concepts. Indeed, the very concept of occupation is novel, as evidenced by the lack of recognition encountered when using the term in the specialized sense proposed here.

Relationship Between Occupational Science and Occupational Therapy
Distinction Between Occupational Science and Occupational Therapy
As already stated, occupational science is the study of the human as an occupational being, including the need for and capacity to engage in and orchestrate daily occupations over the life span (Yerxa et al., in press). The field is named occupational science rather than occupational
therapy because it transmits a basic science regarding the substrates, form, functions, context, and meaning of occupation. Although knowledge derived from occupational science may be applied to the practice of occupational therapy, it is also applicable to an array of other disciplines. The primary focus of occupational science is not immediate application to therapeutic intervention, but rather, transmittal of the most general principles and concepts of occupation.

The profession of occupational therapy has developed a rich background of experience and technical expertise in enabling patients to achieve independence and self-sufficiency. However, occupational therapy was founded primarily on empiricism rather than science. Thus, an intended purpose of occupational science is to organize and transmit the interdisciplinary knowledge that supports practice. Similarly, the profession of medicine in the United States, with the implementation of the Flexner Report (Flexner, 1910), although based originally on clinical practice, became organized around the new paradigm of laboratory practice and germ theory, emphasizing the basic sciences as essential to the training of physicians. In this respect, occupational science is to occupational therapy what anatomy and physiology are to medicine.

Importance of Occupational Science to Occupational Therapy

The development of occupational science as a recognized sphere of scholarly inquiry offers many important benefits to the profession of occupational therapy. Three current priorities of the profession that will be positively effected by the emergence of occupational science are discussed below.

The demand for faculty prepared as scholars at the doctoral level. A shortage of doctoral-level faculty to teach in occupational therapy curricula currently exists (Leonardelli & Gratz, 1986, Parham, 1985). According to one survey, only 17% of full-time faculty in baccalaureate and postbaccalaureate occupational therapy programs held doctoral degrees (Parham, 1985). Most faculty members (70%) held master’s degrees. This condition has had a negative effect on faculty research productivity. In recognition of the gravity of this faculty shortage, the American Occupational Therapy Association (AOTA) report, Occupational Therapy Manpower: A Plan for Progress (AOTA, 1985), recommended that a major goal of the profession be to “increase the numbers of qualified occupational therapy faculty” (p. 62).

Because only three doctoral programs are currently offered by occupational therapy departments, the majority of occupational therapists who hold doctoral degrees have obtained these degrees in other fields, such as allied health, anthropology, psychology, education, anatomy, and public administration. These doctoral students are typically required to demonstrate research competency and contribute to the scholarship of those disciplines. Consequently, it seems reasonable to assume that, perhaps in an effort to continue their research programs, a substantial number of these persons leave occupational therapy rather than contribute to its development as an academic discipline.

Currently, the options for doctoral study for prospective faculty are limited. The recent establishment of a doctoral program in occupational science at USC offers an alternative that is highly relevant to occupational therapy. Further, the continued growth of the basic science of occupation has the capacity to spawn additional doctoral programs that will produce scholars who will contribute to the occupational therapy profession through teaching and research.

The need for basic science research. Because its scope of practice involves all age groups and any disability that might interfere with function, the occupational therapy profession deals with problems of significant complexity, yet its knowledge has not been fully synthesized or organized. For example, children with chronic disability are often unable to engage in normal play (Mogford, 1977; Parham, 1980). This incapacity may have a profound effect on their exploratory behavior and learning of adaptive skills and thus may prevent them from developing work-related capacities as adults. Yet, too little is understood about play in general to enable occupational therapists to intervene effectively. The same paucity of organized knowledge persists throughout all of the dimensions of occupation in relation to every age level.

Philip Austin, president of Colorado State University, Fort Collins, and chancellor of the Colorado University System, identified the need for a science of occupation when he stated, “What is it that makes occupational therapy an academic discipline, as opposed to simply a program of training in an applied activity that incorporates the theoretical base and the methodology of other fields? This is the primary question that has to be answered before we can turn our attention to larger pedagogical and scholarly concerns” (Austin, 1986, p. 53). Occupational science, as conceptualized herein, is posited as the answer to Austin’s question: It is proposed as the foundation for an academic discipline.

The justification and potential enhancement of practice. Occupational science is empowered by the values of occupational therapy. Like occupational therapy, occupational science pays homage to the central role that occupation plays in health, adaptation, and life satisfaction; views the human as an active agent shaping his or her daily life; concentrates on the practical aspects of living; and emphasizes the perspective of the individual, just as therapists have valued the perspectives of their patients. These themes should ultimately create a resonance between occupational science and occupational therapy practice.
More concretely, we believe that the research and scholarship generated in occupational science will be deployed by therapists to recast and reconstruct traditional practice. Recourse to occupational science may also enable occupational therapists to position themselves to meet some of the most critical social and health problems confronting society and, hence, carve out new practice niches.

Through this process of occupational science being generated and therapists using it for the benefit of society, both the science and the profession will be given an even more powerful valence. Occupational science studies, for example, may begin to document the customary round of activities (occupations) of homeless people, thereby providing a database from which psychiatric occupational therapists can begin to conceptualize treatment for the over 350,000 homeless persons, many of whom were displaced from psychiatric facilities (Wolch, Dear, & Akita, 1988). As studies are conducted on the relationship of daily engagement in occupations (e.g., work and leisure) to outbreaks of family violence or child abuse, we may discover powerful methods of countering such events by assisting our patients in the construction of a less stressful, tension-releasing itinerary of daily activities. Further, as research in occupational science elucidates the relationship between engagement in occupations and immunocompetence, therapists may be in a stronger position to assist their patients with AIDS in delaying the disease process through engagement in self-chosen and satisfying occupations (Clark & Jackson, in press). As another example, reportedly, the suicide rate among the elderly is increasing (Staff, 1989). Knowledge generated in occupational science may help the elderly enjoy a better quality of life, while medical technology prolongs their years. As a final example, as the effects of occupation on stress levels become better understood, we may gain insights into how engagements in specific occupations (e.g., running) may curtail the desire for drugs.

Occupational science appears to hold the potential for providing important knowledge of relevance to the social and health problems with which society is currently beset. Because its focus is on occupation, this knowledge is bound to nurture the practice of occupational therapy. Finally, as advances in occupational science receive public attention, occupational therapy as a profession will become better understood and its professional image enhanced, because the very heart of its practice—occupation—will no longer be enigmatic.

Conclusion
Carlos Fuentes (as cited in Terkel, 1988, Notes) said, “We must go forward, but we cannot kill the past in doing so, for the past is part of our identity and without our identity we are nothing.” The formal establishment of occupational science represents a giant stride for our profession. Its emergence, we have argued, will enable knowledge to be generated that has the potential of benefiting society at large as well as the practice of occupational therapy. Further, as occupation becomes more visible and better understood, the professional identity of occupational therapy will ultimately be enhanced.

Acknowledgments
We wish to acknowledge the substantive contributions of Elizabeth J. Yerxa to the conceptualization of occupational science and the development of the proposal for a doctoral program in occupational science, on which this paper is based. This proposal was approved by the graduate school of the University of Southern California, Los Angeles, in February 1989.

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