The Search for Useful Methodologies in Occupational Science

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Key Words: research design • social sciences

Debate currently exists on the soundness of various research methodologies in the social sciences. In the present paper, this question is addressed in relation to the emerging discipline of occupational science. First, the discipline of occupational science is defined. Next, two competing methodologies—Paradigm 1, Positivistic, and Paradigm 2, Naturalistic—are contrasted. The criteria of genuineness and trustworthiness are proposed as crucial for the evaluation of the soundness of available research methodologies for the extension of occupational science. Next, exemplars of research methodologies that meet these criteria are described. In the conclusion, the role that nonscientific ways of knowing, such as art and literature, may play in the understanding of human occupation is discussed.

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This article was accepted for publication March 15, 1990.

In recent years, scholars within the occupational therapy profession have advocated the development of a systematized body of knowledge of occupation in order to support and enrich therapeutic practice (e.g., Nelson, 1988; Yerxa et al., 1989). In the present paper, we address methodological issues that pertain to the development of such a knowledge base. To provide the necessary background, we begin by briefly introducing our conceptualization of a science of occupation. We then describe two prominent methodological orientations that could potentially be employed within such a science. Finally, we argue that research strategies that creatively combine the best features of the two traditions offer the greatest degree of promise for increasing our understanding of occupation, and we present two specific examples of such novel, worthwhile methodologies.

Occupational Science

Occupational science is an emerging discipline that is defined as the systematic study of humans as occupational beings (University of Southern California [USC], Department of Occupational Therapy, 1989). The term occupation, conceived more generally than in the conventional sense of a job or career, refers to a culturally defined activity that is purposively undertaken within a given segment of time (Nelson, 1988; Yerxa, 1988; Yerxa et al., 1989). Examples of occupations are interaction with a personal computer, scuba diving, and watching television. In harmony with the assumptions of our profession, studies have shown that engagement in such ordinary daily activities (i.e., occupations) significantly affects health, happiness, and life satisfaction (e.g., Emmons, Diener, & Larsen, 1986; Rodin & Langer, 1977).

The goal of occupational science is to generate a systematic base of description and understanding concerning participation in occupations (USC, Department of Occupational Therapy, 1989). In line with the working tenets of occupational therapy, occupational science emphasizes the human capacity to actively pursue occupations as a means of adaptation to life’s challenges. It is concerned with the development of occupational choice and behavior throughout the life span and looks at the gamut of factors that are relevant to occupation, including physical and biological, psychological, and sociocultural considerations. The subject matter of occupational science is more similar to that of the social sciences than to that of the physical sciences. An important function of occupational science is to provide basic knowledge that supports the applied practice of occupational therapy (Yerxa et al., 1989).

Epistemological Issues in Occupational Science

In attempting to understand any phenomenon or related set of phenomena, one may access a broad spectrum of epistemological strategies (i.e., methods of knowing).
Lincoln and Guba (1985), for example, listed the following: (a) adversarial (as used in the legal system), (b) logical (characterizing philosophy and mathematics), (c) judgmental (as in athletic competitions and beauty contests), (d) demographic (as used in economics), and (e) religious. An advocate of the comprehension of art as a form of inquiry, Goodman (1984) claimed that "reverberations from a work [of art] may travel in cycles through our everyday environment, other works, and itself, again and again, with ever changing effect. Works work by interacting with all our experience and all our cognitive processes in the continuing advancement of our understanding" (p. 180). Most recently, Rorty (1989) argued that literature constitutes one of the most powerful means of informing us about the morality of certain social actions. Finally, Campbell (1972) urged us to draw on myth to access fundamental knowledge about the purposes and meaning of actions in our lives.

Conspicuously absent from this list are two forms of human inquiry, scientific and naturalistic, which Lincoln and Guba (1985) classified as disciplined because their methods of data handling are subject to public scrutiny. Is the scientific method (defined by Lincoln and Guba as the experimental method) the most legitimate approach that can be used to generate reliable knowledge about the world? Although in an abstract sense the conventional scientific method may be the best method of establishing a hard science, can one question its suitability for investigating research questions that consider human symbol systems, such as the issue of how people imbue their actions with meaning? If one rejects the scientific method as too reductionistic (i.e., oversimplistic in the sense of reducing complex events to their putative, more basic building blocks) and chooses to use other options, does one build a humanities instead of a science? What is science anyway?

These are the types of questions with which our faculty grappled as we began to conceptualize the establishment of a doctoral program in occupational science at the University of Southern California in Los Angeles. Our first challenge was to develop a working definition of science that would allow us to incorporate potentially applicable nontraditional methodologies. We defined science as a systematic (i.e., rule-bound) and empirically based form of human inquiry undertaken by a community of scholars. This definition allowed us to include traditional experimental procedures as well as phenomenological approaches, such as ethnography and life history, in our conceptualization of legitimate occupational science inquiry. Our second challenge was to identify the types of methodological strategies that would best enhance our knowledge about occupation.

Toward the latter end, in the following section we have outlined and compared the two currently prevailing epistemological orientations within the disciplines that are the closest to occupational science in terms of study content. This is followed by a presentation of two innovative methodologies that we believe are noteworthy in terms of their capacity to produce useful occupational science knowledge by virtue of combining the best features of the two paradigms.

Methodological Paradigms 1 and 2: Two Contrasting Models of Inquiry in the Social Sciences

Methodological orientations to research can be thought of as paradigms in that they are founded on a set of assumptions that critically direct the process of inquiry, including the approach that is taken in making observations and interpreting the outcomes. Two major research paradigms can be distinguished within the disciplines that are most closely related to occupational science: that is, the disciplines of anthropology, psychology, and sociology (Bogdan & Biklen, 1982; Carlson, 1984; Sampson, 1978). As was done by Sampson, we will refer to these approaches as Paradigm 1 and Paradigm 2, respectively.

For our purposes, Paradigm 1 will designate the currently dominant tradition of positivism, in which emphasis is placed on the discovery of abstract, generalizable, preferably cause-effect laws through objective observation of natural phenomena on the part of the scientist. The use of this general orientation in understanding complex human behavior is rooted historically in the social sciences' importation of the methods of the natural sciences (Lincoln & Guba, 1985) and is associated with the use of laboratory experimentation, operational definitions, quantitative measurement, and a hypothetico-deductive approach as well as with philosophical assumptions such as determinism and reductionism (Bogdan & Biklen, 1982). Most of mainstream experimental psychology exemplifies the application of Paradigm 1 thinking.

Paradigm 2 represents a different, more holistic methodological approach. It is based on the assumption that a central goal of social science inquiry is to understand the interpretations and meanings that persons negotiate in socioculturally concrete natural settings (Sampson, 1978). This general orientation, which is characteristic of much anthropological research, is associated with such methodologies as ethnography, participant observation, case study, life history, and phenomenological analysis. The aim of Paradigm 2 research is to provide an understanding of how people make sense of their lives in the midst of the fluid complexities that characterize social situations. Typically, such investigations result in rich, qualitative description, with the researcher himself or herself serving as the primary data-gathering instrument. Theoretical concepts are not imposed on the data, but rather, emerge from the particulars of the specific research context (e.g., grounded theory [Glaser & Strauss, 1967]). A hermeneutic element is common in Paradigm 2 methodology (i.e., the correctness of the investigator's
interpretations is checked by talking with the research participants).

The Relevance of Epistemology to the Genuineness and Trustworthiness of Social Science Research

To succeed as an enterprise, occupational science must yield insights about occupation that are neither trivial nor reductionistic (Yerxa, 1988). In addition, to be maximally useful, its results must be trustworthy in the sense that different persons, including therapists and scholars, have confidence in their accuracy and lack of bias. We believe that the two primary methodological strategies in the social sciences, corresponding to Paradigms 1 and 2, typically generate knowledge that is not simultaneously genuine in terms of its studied content and demonstrably trustworthy in terms of the results achieved. This situation has restricted the overall usefulness of social research.

In Figure 1, we present a classification of the varieties of knowledge that commonly arise from social science research. Within the figure, resultant knowledge is plotted along the dimensions of genuine versus contrived study content and documented versus undocumented trustworthiness of the reported results. The dimension of genuineness refers to the actual content of what is attended to in a research investigation. Paradigm 2 researchers, by focusing on the fluid, complex interactions of persons within their natural environment, establish the genuineness of what is studied. In contrast, most Paradigm 1 investigations are plagued by a lack of realness in terms of what is actually studied. This is because the researchers (a) attempt to isolate the effects of single variables that in actuality interact with numerous qualifying factors, (b) analyze variables that may only loosely approximate the construct that is the true focus of investigation (e.g., use of an IQ test to assess intelligence), or (c) decontextualize the phenomenon under investigation by employing a laboratory setting.

The horizontal axis in Figure 1, which corresponds to trustworthiness of research results, reflects the notion that, other things being equal, demonstrably reliable findings will better serve the goals of basic understanding and practical application. Our use of the trustworthiness versus untrustworthiness continuum is intended to capture the entire set of methodological considerations that make a specific research observation either widely accepted or questionable, respectively.

Generally, to the extent that (a) a high degree of interpretation is inherently associated with the reporting of research results, (b) the investigator’s bias may affect the results, or (c) empirically based estimates of the generalizability of the findings across groups or persons are unavailable, the trustworthiness of the results of a given research project will not be established. Consequently, the study will be less useful for future application than would be the case if such undesirable features were absent.

Such problems tend to be present more often in Paradigm 2 research. In certain cases, however, a sense of trustworthiness may emerge even when an account of results is largely interpretive or does not provide statistical estimates of generalizability, provided the interpretation is coherent, develops logically from the data, appears accurate, and seems to reflect a careful application of explicit rules of inquiry. Goodall’s (1986) description of the patterns of behavior exhibited by chimpanzees in Gombe Falls in this category and is an excellent example of interpretative research. The inclusion of numerous technical tables, ongoing involvement with chimpanzees for two decades, focus on detail, creative organization of the narrative, inclusion of pictures, and scope of research ultimately inspire confidence in Goodall’s results.

Within Figure 1, the four corners of the square correspond to the logical extremes of knowledge that result from the combining of the two axes. The upper right corner represents the most desirable state of affairs for a research methodology in that it implies the existence of knowledge that is well established in terms of both its genuineness and trustworthiness.

We propose that the two dominant methodological orientations that are relevant to the social sciences, namely, Paradigms 1 and 2, tend to produce knowledge that falls within the upper left or lower right areas of Figure 1, namely, the areas in which one, but only one, of

![Figure 1. A graphic depiction of knowledge that may result from social science research.](http://ajot.aota.org/pdfaccess.ashx?url=/data/journals/ajot/930283/)
the desiderata of genuineness and documented trustworthiness is satisfied. The bulk of the "soft" methodological procedures that are associated with Paradigm 2 directly address complex, meaningful issues but are oftentimes weak in their ability to produce trustworthy conclusions. For example, Freud's (1914/1966) insistence on the importance of psychosexual stages, based largely on in-depth data-gathering techniques that would best be placed within Paradigm 2, has been the subject of much debate due to the inability of the underlying methodology to demonstrate the trustworthiness of the findings. Conversely, the application of the "hard" methodologies to study complex social phenomena often produces demonstrably trustworthy, agreed-on results that are questionable in terms of their meaningfulness due to the contrived nature of what is actually studied. For example, the bulk of social psychological research on human aggression has been drawn into question by some authors (e.g., Tedeschi, 1983) because it has featured the use of highly unusual apparatuses within artificial laboratory conditions.

At a fundamental level, a correlation would seem to exist between a researcher's epistemological assumptions and the composition of the results that tend to be produced. Given that one accepts procedures such as phenomenological analysis and in-depth interviewing as trustworthy means of knowing, there is no reason to restrict the genuineness of the phenomenon that will be observed, because such techniques are as applicable to real-life settings as they are to a laboratory. Conversely, a researcher who is committed to rigorous experimentation will generally be forced into the lower right portion of Figure 1. Although such a person would ideally prefer to directly study his or her research question both in all of its complexity and in the natural environment, such an action is typically forbidden by practical methodological constraints on the content of what can be studied.

We do not claim that the research associated with the two paradigms is useless; rather, we feel that the knowledge that is gained is often suboptimal in that it fails to jointly satisfy the criteria of genuineness and trustworthiness. Additionally, it should be noted that in Figure 1, for heuristic purposes, the two paradigms are equidistant from the upper right corner. One might argue that the respective deficiencies of the two paradigms are not equally problematic, as implied by such a heuristic. The key point, however, is that the value of any given research activity is enhanced to the degree that its underlying methodology is capable of producing knowledge that falls into the upper right corner of the figure.

Noting the discrepant types of knowledge that are generated within Paradigms 1 and 2, some authors have advocated the strategy of juxtaposing the research results obtained separately within each paradigm in order to achieve a better understanding of complex topics (e.g., Kenrick, 1986; McGrath, 1982). This strategy strikes us as superior to the all-too-common methodological ethnocentric refusal to countenance research findings arising from outside one's own paradigm. When the findings obtained through different approaches are compared, however, the danger exists that noncomparable features of the divergent research studies (e.g., differences in the level of analysis, subjects, or settings) will preclude a meaningful synthesis. In the context of cumulating research findings through meta-analysis, this general concern is known as the problem of apples and oranges (Glass, McGaw, & Smith, 1981).

The most promising methodological strategies for the development of occupational science are those that simultaneously merge the respective strengths of Paradigms 1 and 2. It is expected that such research will generally require a relatively high level of effort. This requirement of increased effort is a consequence of the fact that most of the important issues surrounding human occupation are by nature highly complex and context dependent. It is not surprising that shortcut methodological strategies are expected to generate results that are relatively unimpressive. Our analysis thus mandates a redistribution of research efforts in the direction of fewer, but methodically more enterprising, studies being undertaken.

Some authors have argued that attempts to combine elements from the two primary methodological paradigms are futile insofar as their respective philosophical underrunnings are inherently contradictory (e.g., Guba & Lincoln, 1988; Lincoln & Guba, 1985). Although this issue is complex and we will not attempt to deal with it in its entirety, we would point out that the specific desirable aspects of research that we recommend maximizing within a single study (viz., the genuineness of what is studied and the trustworthiness of the results) are not among the mutually exclusive set of philosophical tenets associated with the two paradigms. Thus, for example, qualitative researchers have been encouraged to enhance the reliability (trustworthiness) of their work by better documenting their ethnographic decision-making processes (Kirk & Miller, 1986). Paradigm 1 researchers would argue that, other things being equal, increasing the genuineness of what is studied is a highly desirable goal (e.g., Campbell & Stanley's [1963] emphasis on external validity).

We therefore view the correlation of paradigm type with trustworthiness and genuineness to be based largely on practical limitations and not on philosophical necessity. It is difficult to generate trustworthy results when studying a phenomenon in its complexity in the natural environment. We believe, however, that occupational science research will generate more meaningful results to the extent that such efforts are made. In the following section, we will review the work of two persons who we believe have developed innovative methodologies that feature a high degree of both genuineness of content and trustworthiness of results.
Exemplary Research Strategies in the Study of Human Occupation

Csikszentmihalyi’s Experience Sampling Method

Csikszentmihalyi’s experience sampling method (Csikszentmihalyi & Larson, 1987; Csikszentmihalyi, Larson, & Prescott, 1977) represents a methodological innovation that has significantly enhanced our knowledge of the effects of everyday activities on human cognition and affect. In this procedure, subjects are instructed to carry a small electronic signaling device as they undertake their daily routines in the natural environment. Activation of the device, which occurs at random intervals throughout the day, serves as a cue for the subject to fill out a self-report questionnaire concerning his or her ongoing activities, thoughts, and mood states. Thus, use of the experience sampling method enables the researcher to systematically study the relationship between daily events and alterations in the stream of consciousness, a topic of great importance that had previously been largely inaccessible to researchers. Studies have supported the basic reliability and validity of this technique (Csikszentmihalyi & Larson, 1987).

On the basis of research that employed the experience sampling method, Csikszentmihalyi (Csikszentmihalyi & Csikszentmihalyi, 1988) developed a theory of flow. Flow is defined as the positive psychological state that results from engagement in activities that provide a degree of challenge commensurate with one’s self-perceived level of skill and is accompanied by such features as heightened concentration, a merging of activity and awareness, and a distorted sense of time (Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988). The concept of flow is highly relevant to occupational science because it documents an everyday phenomenon that importantly relates to, among other things, happiness, self-esteem, work productivity, the enjoyment of leisure, and life satisfaction. Extensive cross-cultural investigations have shown that flow is a universal human experience (e.g., Carli, Fave, & Massimini, 1988; Fave & Massimini, 1988).

In our view, Csikszentmihalyi’s (Csikszentmihalyi & Csikszentmihalyi, 1988) theory of flow is an outstanding example of knowledge of occupation that is both genuine and documentably trustworthy. In describing the experience sampling method that underlies most of the research on flow, Csikszentmihalyi and Larson (1987) noted, “Its main contribution has been to make the variations of daily experience, long outside the domain of objectivity, available for analysis, replication, and falsifiability, thus opening up a whole range of phenomena to systematic observation” (p. 533).

Despite his primarily positivistic methodological orientation, as voiced in the above quote, Csikszentmihalyi (Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988) has generated meaningful, useful knowledge by expanding the range of application of rigorous quantitative methodology. Thus, in Figure 1, his work is portrayed as a movement along the vertical axis of genuineness toward the upper right corner. His research has not only significantly enhanced our basic knowledge of occupation but has also provided important insights concerning the therapeutic use of occupations to promote life satisfaction and health. For example, by drawing on Csikszentmihalyi’s findings, a therapist may more informatively select and recommend occupations for his or her patients that are likely to result in a flow experience, which is likely to enhance the patient’s subjective sense of well-being or decrease boredom. Overall, reference to this body of research should enable therapists to do more sophisticated activity analyses for the purposes of intervention.

Schön’s Procedure for Studying Reflection in Action

Schön’s (1983) research reflects the use of a Paradigm 2 methodology for the ultimate purpose of discovering a new epistemology of professional practice (i.e., an explanation of how professionals think in action). Although he employed a naturalistic methodology (Paradigm 2) to address this problem, in the final analysis, he proposed a reflection-in-action theory that is applicable across numerous practice arenas and that takes the form of the kind of generalizations that are independent of context and time, as are associated with Paradigm 1. We have chosen to highlight Schön’s work because it blends a focus on genuinely meaningful content with an investment in rigorous methodology and depicts the use of naturalistic inquiry for the purpose of deriving general principles, in this case, of reflection in action. The following presentation is based on Schön’s book The Reflective Practitioner as well as on impressions gained from an address he delivered in 1988 at the American Occupational Therapy Association’s Annual Conference in Phoenix, Arizona.

Before the generation of Schön’s (1983) theory, professional practice was viewed as governed by technical rationality, a derivative of positivism that asserts that “professional activity consists in instrumental problem solving made rigorous by the application of scientific theory and technique” (p. 21). According to Schön, technical rationality was adopted as the sole explanation of practice, in part, because it ensured inclusion of professional schools in the university, which had, since the latter part of the 19th century, embraced positivism and the conventional scientific method as the most legitimate form of inquiry. Technical rationality anchored professional activity to the basic sciences and presented practice as the straightforward application of technical knowledge to human problems and predicaments.

According to Schön (1983), the model of technical rationality also governed the sorts of scientific inquiry that were undertaken to support professional practice and dictated the texture of professional curricula. Rather
than investigations of value-laden and context- and time-bound practice problems saturated with uncertainty, instability, and uniqueness, research proliferated in the natural and social sciences, which addressed phenomena more amenable to investigation with the use of conventional methodologies derived from Paradigm 1. Correspondingly, professional curricula were conceptualized such that they included basic science, applied science, and practice components, with the basic science component occupying the highest position in the knowledge hierarchy. A logical development of this perspective was to view the researcher as superior to the practitioner and for a schism to exist between professional knowledge and practice elements in the real world.

The focus of Schön’s (1983) systematic inquiry has been on uncovering the ways in which professionals think or reflect during practice. The work is meaningful in that it challenges the prevailing assumption that professional practice can be explained through exclusive recourse to technical rationality. Further, it appears trustworthy because of its rigorous hermeneutic methodology. Thus, we believe that with respect to Figure 1, Schön’s (1983) work falls within the upper right quadrant.

To study thought in action, Schön (1983) devised and employed a new research procedure that involved taping episodes of practice, transcribing the discourse that occurred in these episodes, and then conducting private interviews with the professionals involved. During the interviews, the respondents were asked to review the taped episodes and reflect on their reflection in action (i.e., on their thought processes that shaped their choices of action in the episode). Sometimes the respondents were encouraged to develop stories about their practice, which could then be interpreted; in other situations, they were asked to respond to conflicting interpretations hermeneutically. In this manner, the respondents, with the aid of the researcher, were able to construct a coherent interpretation of their reflection in action.

Schön’s (1983) analysis of these data, however, went beyond interpretation of particular case studies. Departing from the epistemological tenets of Paradigm 2, he extracted principles of professional reasoning that are applicable categorically to practice situations. Although professionals do to some extent use basic science in naming and framing practice problems, Schön argued that they also rely on intuition, practice experience, on-the-spot experiments, and tacit knowledge. In the final analysis, practice emerges not as the exclusive application of scientific principles to the study of human problems, but as a reflective conversation with oneself in which technical knowledge is enmeshed in a context of meaningful interaction.

Following in this tradition, Mattingly (1989) studied how occupational therapists use stories as a vehicle for guiding and interpreting clinical practice. In contrast to the typical efficacy study that uses a Paradigm 1 methodology, in which the treatment process is typically described as a rigidly set protocol, Mattingly’s work revealed that when occupational therapists treat patients, they do so in a fluid manner, in a context in which experience often conflicts with a planned course of action. Thus, the treatment process is revealed to be improvisational. Without Mattingly’s work, our conceptualization of the treatment process may have remained shallow, tainted by a false sense of regularity.

Conclusion

The works of Csikszentmihalyi and Schön are exemplary in that they have circumvented the primary problems associated with the mainline research traditions that they respectively favor. Csikszentmihalyi (Csikszentmihalyi & Csikszentmihalyi, 1988; Csikszentmihalyi & Larson, 1987) is noteworthy in that he has creatively applied Paradigm 1 methodology to study in a genuine way a rich, important human issue, namely, the study of daily occupations as they occur in natural settings. Few persons grounded in the traditional Paradigm 1 approach have been as ambitious. In a similar vein, Schön (1983), whose emphasis on phenomenological inquiry places him within the Paradigm 2 camp, is an anomaly among Paradigm 2 social scientists in that he has set out to develop a careful, rigorous methodology designed to demonstrate the trustworthiness of his obtained results. Due to their explicit attempt to blend the two key desiderata of genuineness and trustworthiness, Csikszentmihalyi and Schön have produced methodologies that are capable of significantly furthering our knowledge of human occupation.

We have proposed that social science knowledge resulting from the exclusive use of Paradigm 1 or Paradigm 2 methodologies typically fails to be simultaneously genuine and demonstrably trustworthy. Paradigm 1 methodologies tend to yield results that are trustworthy but not genuine; Paradigm 2 forms of inquiry generate the opposite. We then presented examples of research strategies that combine the strengths of both methodologies, examples which we believe enable us to acquire important knowledge about occupation.

We acknowledge that ways of knowing other than those that we would deem scientific may play a key role in elucidating occupational science issues and problems. For example, we would place art and literature in the upper right corner of Figure 1, provided such works possess both meaningfulness and trustworthiness. Goodman (1984) strongly endorsed the view that science is simply one of many ways of knowing and illustrated this point by illuminating the knowledge-generating functions of science and art, as captured in this passage:

The naive notion that science seeks truth while art seeks beauty is wrong on many counts. Science seeks relevant, significant, illuminating principles, often setting aside trivial or overcomplicated truths in favor of powerful unifying approximations. And art, like science, provides a grasp of new affinities and contrasts, cuts across
worn categories to yield new organizations, new versions of the worlds we live in. (p. 5)

We believe that the works produced in the humanities that can be placed in the upper right quadrant of the bivariate model (see Figure 1) constitute a rich source of inspiration and insight for occupational science. The humanities and science are not in opposition; rather, each has enormous potential to enhance our understanding. The synergistic effect of the synthesis of knowledge generated in the humanities with the results of well-executed science may ultimately provide the clearest and most compelling accounts of human occupation. ▲

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