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Human Behavior and Complex Systems

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A NOTE TO READERS

The purpose of this book is to provide a launching pad for the ongoing study of human behavior for graduate-level social workers and other human service professionals. It is designed as an integrative review that is best suited for graduate students who have majored in the social sciences as undergraduates. In addition, it updates this content with some of the most recent developments in the relevant fields and explores applications of human behavior theory and research in advanced professional practice, particularly that which is multidimensional.

Several motivations have stimulated the development of the first edition of this textbook over the last seven years. As a social work faculty member involved with teaching human behavior courses for graduate students, myself and my colleagues have encountered considerable difficulty in locating suitable readings. There are many informative textbooks available, but most of these tend to be written for the undergraduate student, are overly descriptive, and often short-shrift both theory and research. But most important, even when these texts do include theory, they often emphasize traditional equilibrium and general systems theories, continuously repackaging the same material from prior generations and ignoring contemporary developments.

In recent years, there has been a sea change in many fields in the ways that systems are thought about, mainly as a result of several developments that are variously referred to as complex systems theory, nonlinear dynamics, non-equilibrium theory, or even chaos theory. This new focus represents an emerging multidimensional paradigm. Many of the core assumptions of structural-functionalism, general systems theory, traditional ecological theory, as well as the classical psychodynamic and cognitive theories are no longer tenable. Thus, a central intent of this textbook is to introduce this new paradigm in terms that is both understandable and relevant for the human services practitioner, and to explore how the traditional theories are gradually

being reframed and refined in the light of these recent developments. Most important is the exploration of the practical implications of this newer paradigm for advanced practice. In this book, exploration of its implications is most often done in relation to the assessment process. It is also done specifically in relation to a conception of advanced generalist practice that is grounded in theories of complex systems and self-organization, as well as evidence-based practice. It is a conception that emphasizes the critical integration of values and ethical decision-making when understood within a dynamical framework.

The title of this book represents a slight departure from the traditional nomenclature of ‘human behavior and the social environment’. The term ‘human behavior’ is retained here, if only because of its recognizability. But its meaning is interpreted broadly to also include the study of consciousness, states of subjective well-being, motivation, culture, and in general, the phenomenological aspects of inner experience, both individual and collective. However, the term ‘social environment’ is dropped and this done is for several reasons. As important as social environments are, other dimensions such those involving cultural, economic, biological and physical systems are also important, and these can not continue to be neglected. There is no singular environment, even for a lone individual, but rather each person and group transacts business with multiple environments, loosely entangled with one another, some of which may be monolithic and passive, but others of which are variegated and dynamic, oppressive or nourishing, as the case may be. Furthermore, large systems are not just contexts but can be agents and problem solvers in their own right. The term ‘complex systems’ is used partly to be informally descriptive of the challenges posed by these diverse systems, including those that are directly involved in social and psychological functioning, and to highlight the difficulties of working with these systems. But more important, the phrase is also used to identify the specific

theoretical paradigm that is introduced in the first chapter, namely the the newer generation of systems theories such as non-linear dynamics, chaos theory, self-organization, and social autopoiesis. The term ‘paradigm’ is used here to refer to unarticulated all-encompassing frameworks, in the way that Thomas Kuhn (1970) used it, one that organizes a range of theories, models, and hypotheses that derive from such a paradigmatic perspective. Finally, the term ‘multidimensional’ refers to the grounding of advanced professional practice, e.g. that on the MSW or post-graduate level, in the theory and research on multiple psychological, social, and ecological systems, and their interactions. More specifically, this textbook is designed to support a model of advanced generalist practice as it is now being taught in a wide range of graduate programs of social work. Reference to ‘advanced generalist practice’ is left out of the title mainly because of the book’s relevance to other approaches to practice, such as various models of advanced clinical practice. There are several additional themes and content areas that characterize the approach of this book, and these are identified in the brief introductions of each of the four parts of the text.

This text aims to strike a balance between a succinct discussion of traditional areas of human behavior content and the emerging paradigms already mentioned. On one hand, the traditional areas range from general systems and ecological theory, to the various developmental and life cycle models, theories of psychopathology, and various theories of group, family, organizational, and community development and dynamics, to name a few of these topics. On the other hand, this book addresses the neglect in most texts of some critically important subjects. These include complex systems theories, including self-organization and self-selection, as well as recent developments in the understanding of consciousness, motivation, and personality; critical thought, problem solving, decision making, creativity, as well as spirituality. Among the other

contemporary developments reviewed are ecological psychology, evolutionary psychology, network theory, self-organization, and communities of practice.

The material is organized so that it can be covered in either a single integrative human behavior course, or divided between two courses, perhaps one that focuses on micro-level theories and another that covers larger systems. For this reason, the material in this text is not organized by life stage, problem, or theory, but primarily by system level.

The content of this text is designed to support all the major areas required by the Council on Social Work Education to be covered in graduate-level human behavior courses. Each program has flexibility about how this can be done, but in general terms these standards require content on human diversity, values and ethics, populations-at-risk, social and economic justice; theory and research that range from the biological, to the psychosocial, cultural, and spiritual; and to diverse system levels, from the individual to the societal and economic. *Table P.1* is a checklist illustrating the areas covered by each chapter, some in as little as a paragraph or two, but many representing substantial portions of the designated chapter. A few of these merit some elaboration here. Historically, the biological dimensions have been neglected in human behavior curricula. Thus, in this text, this content is infused at multiple points. It includes evolutionary theory in the chapter on change, neurophysiological material in the chapter on consciousness, biological maturation, infant temperament, neurochemical mechanisms, and sexual development in the chapter on development; biological theories of personality and mental illness in *chapters 6* and *8*; biological theories about skin color differences and interuterine development of homosexuals, as well as the characterization of haplotypes and haplogroups, the major categories of human biodiversity, in the chapter on diversity. Even in the concluding chapter on ethics and spirituality, there is a brief overview of research on the biological underpinnings of values.

Discussions of the applications of economic, social, and psychological theories to selected oppressed or at-risk populations, such as Hispanics, African-Americans, women, Gays and Lesbians, East Asians, low-income individuals, and the elderly, are included either in the chapter on Diversity (*chapter 13*) or in earlier chapters, either as part of the text or its associated tables and sidebars.

[INSERT TABLE P.1 ABOUT HERE]

Human Behavior and Complex Systems is written for both graduate students and their faculty and other scholars in various human service professions and associated disciplines, such as social work, community counseling, psychology, or applied sociology masters programs. It is also suitable for use as part of doctoral programs in these fields, but would not be recommended for most undergraduates, with the exception of advanced honors students. The text is designed to be the primary textbook for required human behavior courses within these programs, either for a single course or a sequence, or to be function as a theoretical review. In either case, the instructor has considerable flexibility in picking or reordering chapters, but most students will find those under *Part I – Framework*, especially *Chapter 1*, to be particularly important early in their study for the understanding of complex systems concepts that are more briefly revisited or applied in later chapters. Each chapter should be treated as a jumping off point for further study, with the instructor delving into only the material that is most pertinent to the objectives of his or her course. Depending on whether the integrative textbook for a single or a sequence of courses, the instructor may also wish to provide supplemental material to explore in greater depth specialized topics of high priority. For example, an instructor teaching the first of two human behavior courses, one that focuses on theories having to do with the individual person, may want to assign supplemental readings in the areas of human development. This might involve

particular life stages, or alternatively, more indepth material in the area of psychopathology, or on groups or families.

Finally, an important caveat needs to be noted here. Because of the breadth of this text, its focus on theory, and its introduction of emerging areas not covered in most undergraduate courses, it is not light reading. As with any difficult subject, students will need to grapple with the material, and sometimes reread sections, check the glossary at the end of the text, or study the supplemental materials, either those listed at end of each chapter, listed in the references, or identified by the instructor. Students are encouraged to also study the supplemental materials in the various tables, figures, and sidebars that illustrate content in the text. Throughout their study, students should be challenged to read actively and critically, constantly asking, what is being said? What is the basis of this or that theory? What are its practical implications? Early in their study, it is recommended that the instructor review for students the various criteria for critically evaluating theories, and this may be done through use of *sidebar 3.3 in Chapter 3* “Criteria for the Assessment of Theory”. Instructors are also encouraged to supplement this textbook with audiovisual materials, small group tasks, case examples, class discussions, and the like. CGH

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[Permissions for various tables and figures to be included here, or elsewhere?]

For my wife Barbara

PART I:

THE FRAMEWORK

CHAPTER 1

THE ASSESSMENT OF COMPLEX ADAPTIVE SYSTEMS

I. INTRODUCTION

II. EQUILIBRIUM THEORY

- A. Early History
- B. Structural-Functionalism
- C. General Systems Theory
- D. Ecosystems Theory
- E. Deep Ecology

III. COMPLEX SYSTEMS THEORY

- A. Overview
- B. Nonlinear Dynamics
- C. Chaos Theory
- D. Self-Organization Theory
- E. Autopoiesis Theory

IV. CASE ASSESSMENT BASED ON COMPLEX SYSTEMS THEORY

- A. The Process of Assessment
- B. Its Content

V. SUMMARY

We live our lives inscrutably included
within the streaming mutual life of the universe.
Martin Buber

I. INTRODUCTION

This textbook and this chapter in particular introduces an emerging theoretical framework for assessment and intervention in the multiple personal and social systems that human service professionals are regularly asked to help with. This framework includes elements of several perspectives that became popular in the later half of the twentieth century, including the traditional structural-functional, general systems, and ecological theories. However, it goes well beyond these to incorporate several newly developed paradigms which have been collectively termed complex systems theory, and these include chaos, self-organization, autopoietic theories. Unlike the earlier theories that focus on understanding the conditions for the maintenance of stable or equilibrium conditions, complex systems theories concern systems that function in ‘far from equilibrium’ conditions. In this respect, they aim at clarifying the *dynamics* of systems, or the processes and means that systems move from one state to another, how they disintegrate or develop greater levels of adaptability and creativity. The theories covered in this chapter are a part of an overarching framework or meta-theory of practice, which, in subsequent chapters, are applied to particular areas of concern, such as psychopathology, diversity, and community dynamics.

These newer theories have not replaced, but instead have supplemented the earlier general systems model that can now be regarded as describing a special type of system embedded in a broader array of social phenomena. Both general and complex systems theories involve several themes which will be explored throughout this chapter and the entire text, and these include:

- ▶ **Systems:** Much of what human service professionals work with involves systems that are simply defined as *collections of interrelated parts which typically function as a unit and change in concert*. The term has a wide variety of meanings and connotations that range from cultural,

political, and bureaucratic systems, to family and personal psychological functioning, to biological entities.

- ▶ **Holism:** Systems, it is often said, are ‘greater than the sum of their parts’. They can not be understood adequately through reductionism, which refers to the inappropriate and simplistic application of theories pertinent to one level of analysis, such as the biological, to another level, such as the psychological. In any holistic approach, analytic methods involving the examination of parts of a system must always be secondary to multidimensional efforts to understand the whole system.
- ▶ **Emergence:** Similarly, as systems and other phenomena develop, they take on characteristics which are not predictable, at least in any simple fashion, based on the characteristics of earlier or component systems.
- ▶ **Interdependence:** Causation involves multiple and interactive relationships in which the condition of each part is dependent on that of the other parts. This is a modern re-statement of John Donne’s observation that “No man is an island”, that whether families, communities, or nations are considered, the welfare of each is dependent on the welfare of the other, and this is becoming increasingly true in this era of globalization.

In addition, this new generation of systems theories is defined by its concern with the *dynamics of complex and nonpredictable* systems that operate at the *edge of chaos*, and which are often characterized by *consciousness*, including the intentions and aspirations of individuals and groups.

- ▶ **Dynamics:** Although the study of the processes of change is not new, complex systems theorists have raised dynamics – whether of psychological, family, or political functioning – to the forefront of investigation. Unlike the older equilibrium theories that regard change as the exception, change is regarded as universal and typically “irreversible” in complex systems theory (see Prigogine & Stengers, 1984). This study has, in addition, moved beyond the traditional focus on linear or tit-for-tat relationships, but emphasize nonlinear dynamics.
- ▶ **Complexity:** Many clients, as well as professionals, yearn for simple solutions, sometimes for ‘magic pills’. However, human service professionals are increasingly recognizing the sobering reality of intractably complicated systems, which sometimes do not seem to operate according to any apparent rhyme or reason. Formally, complex systems have been defined as “those [systems] formed by a large number of discrete elements that are highly interconnected in non-trivial forms.” (Varela & Coutinho, 1991). Complexity is more than a system being complicated with lots of parts, but also involves interconnections that are typically nonlinear. Yet, despite their apparent complexity, it has often been found that simple rules and principles generate complex systems.
- ▶ **Nonpredictability:** Findings emerging out of chaos theory, demonstrate the impossibility of predicting the long-term evolution of complex systems. Chaos theory is in part based on the principle of “sensitivity to initial conditions”, or the idea that very small differences in initial conditions can result in wildly divergent outcomes.
- ▶ **Edge of Chaos:** It is being increasingly recognized that the creative functioning of both individuals and larger social systems requires a delicate balance between stable and chaotic processes, usually referred to as the ‘edge of chaos’.
- ▶ **Consciousness:** At the same time that many general systems theorists attempt to approach the study of systems through the perspective of the detached, external observer, complex systems

theorists are increasingly considering the perspective of the participants, their purposes, values, beliefs, and consciousness. Carl Popper foreshadowed this shift of perspective with his distinguishing the three perspectives involving the objective (“it”), the subjective or psychological (“I”), and the cultural worlds (“we”) (Popper & Eccles, 1977).

The foregoing are a few of the core themes and associated terms that define and characterize complex systems theory and its applications. This chapter explores these ideas through a discussion of the major complex systems concepts that are particularly relevant for human service professionals.

Work on systems theory has progressed on several fronts. In its inception and in its continuing development, complex systems theory uses an extensive array of mathematical and modeling techniques. These techniques, however, are infrequently used by human service professionals or researchers. Typically, most applications in the human services have involved the conceptual and metaphoric applications of these ideas. Few human service professionals have the needed quantitative skills, let alone the extensive data required for these applications. Many have criticized an exclusively metaphorical approach to the subject, pointing out misunderstandings and misapplications of the fundamental ideas. Thus, it is critical that applications of these ideas go beyond philosophical speculations, but are also grounded in both empirical and phenomenological research. Nonetheless, the metaphorical and conceptual level is an important *starting point* for this work. According to the philosopher of science, Max Black, most scientific models are “systematically developed metaphors” (cited in Barbour, 1974). Whether the atom is imagined as a miniature solar system, the brain as a computer, or society as a biological organism, such metaphoric images make the abstract concrete, suggest new lines of inquiry, but sometimes, lead into conceptual traps. In both the physical and social sciences, metaphors are routinely used in theoretical work, but then they are operationalized, quantified, and tested.

Much of case assessment in the human services also involves the generation of theories, specifically, about the origins and dynamics of client difficulties. The hypotheses often can not be tested through rigorous scientific means, yet given the pressing demands for service, evidence for their validity can often be developed through the process of service delivery itself. Thus, the final part of this chapter will explore the applications of complex systems theory to the assessment process, to the collection of pertinent information through both qualitative interviewing techniques as well as quantitatively oriented assessment instruments, and to the conceptualization of the dynamics of client systems and their environments.

II. EQUILIBRIUM THEORIES

A. Early History. The idea of a system in equilibrium and the requirement that it be understood from a holistic perspective has been traced back to Aristotle (Spurill, Kenney, & Kaplan, 2001). However, it was not until the Enlightenment that such ideas gained increasing attention. A dominant theme at that time was the “harmony of an interlocking order of being.” Examples that have been cited include Adam Smith’s “invisible hand”, involving the beneficial effects of individual self interest on collective economic well-being, and the notion of a “vast harmonious whole of mutually interrelated beings” (Wilber, 1995). Alexander Pope epitomized this perspective in his comment, “Such is the World’s great harmony, that springs from Order, Union, full Consent of things; Where small and great, where weak and mighty, made to serve [each other], not suffer; strengthen, not invade; Parts relate to Whole; All served, all serving; nothing stands alone” (Pope, 1857). August Comte, regarded by many as the founder of sociology, similarly compared society to a vast organism (Appelbaum, 1970).

B. Structural-Functionalism. The ideas of Aristotle, Pope, and Comte are counted among the roots of functionalism, which in turn, contributed to the development of systems

theory. Functionalism was initially developed in England in the early 1900s as a theoretical framework and methodology of study in such fields as sociology, anthropology, and philosophy. It consists of the examination of the relationships between parts and wholes, and focuses on the functioning of social institutions. Its central idea is that social systems are best understood in terms of the functions or the needs that they fill. It directly incorporated Comte's metaphor of society as a kind of biological organism. While the members of a society can be thought of as cells, and its institutions as organs, the functioning of each of these can best be understood to the extent that they help maintain the whole organism. The most critical part involves the macro pattern of roles and interrelationships. Some functionalists argue that while any number of particular individuals or groups may occupy these roles at a given time, these are replaceable when it comes to the overall functioning of the system.

In anthropology functionalism is often associated with Bronislaw Malinowski and A.R. Radcliffe-Brown, the originators of its two principal schools. Malinowski, who introduced psychological or bio-cultural functionalism, argued that social institutions and cultural traits developed to serve the needs of individuals, typically biological needs such as nutrition or reproduction. In contrast, Radcliffe-Brown is known for introducing the structural-functional orientation, which focused not on individuals but social behavior and institutions in maintaining the larger social structure, mainly through interactive feedback loops. Similarly Emile Durkheim argued that social phenomena constitute a domain of functioning that is independent of psychological or biological facts (Broce, 1973, pp. 39-40). Both schools de-emphasized the role of evolution and history, seeing them as of secondary importance compared with current needs, functions, or purposes. The concept of function was later clarified by the sociologist Robert Merton [1910-2003] who distinguished between *latent* and *manifest functions*. While latent

functions involve consequences of social behaviors which are not intended or recognized, manifest functions are those which are intended and official recognized (Kaplan & Manners, 1972).

In sociology Talcott Parsons [1902-1979] proposed one of the better known applications of structural-functionalism, a commonly cited version of equilibrium theory (Parsons, 1951). Parsons argued that, “Society consists of specialized systems and their subsystems, each engaged in a series of boundary exchanges with the other and with other ‘environments’ external to the social system itself...All of these changes pose problems for the systems, forcing the system to specialize in one or another of the four functional prerequisites for existence – adaptation, goal attainment, integration, and latent pattern maintenance [AGIL]” (Apelbaum, 1970).

These AGIL functions are analyzed on multiple systems levels, which Parsons referred to as “action systems”: the organismic, personality, social, and cultural. To the extent that he considered social change, Parsons regarded it as consisting of changes in controls at the highest levels of society (Marx’s “superstructures”). Under Parsons’s assumptions, major social changes originate outside of the system, if they take place at all (Appelbaum, 1970). Parsonian functionalism dominated sociology from the 1950s into the 1970s, when it met with increasing criticism. Like functionalism in general, it was seen as teleological, tautological, static, untestable, and conservative (Bailey, 1994, p. 25). Despite these limitations, functionalism has contributed substantially to the assessment of client systems, maintaining a focus on current changeable conditions in contrast to unchangeable historic and developmental causes, such as early childhood traumas. As functionalism reached its zenith, a closely related perspective – general systems theory – grew in popularity.

C. General Systems Theory. Social workers and other human service professionals

have for long been attracted to notion of understanding the “total situation” of their clients, a term first coined by the social worker Ada Sheffield (1937). For this reason, they have not only been influenced by structural-functionalism, but drawn to the concepts of holism and systems. Ludwig von Bertalanffy’s definition of a system as “a complex of components in mutual interaction... Concepts and principles of systems theory are not limited to material systems, but can be applied to any [whole] consisting of interacting [components]” (1974, p. 1100) laid the foundation for the development of a general systems theory (GST) and its applications in the human services.

General systems theory represents an attempt to integrate the perspectives and findings from such diverse fields as the organismic social theories of the 19th century, the social survey movement, human ecology, information theory, and cybernetics (Leighninger, 1977; Siporin, 1980). Although the concept of general systems theory was initially presented in 1937, and first published in 1945 (Hearn, 1979), it was not until the 1950s that it was popularized in psychology by James G. Miller (1955), and introduced to social work by Gordon Hearn. Then, in the 1960s, general systems attained a level of popularity in social work, mostly through the contributions of family systems therapy, as well as the community mental health movement (Siporin, 1980). The 1970s saw a substantial growth in the applications of GST in the profession, as numerous social work texts began to include the perspective. What follows is an overview of some of the central concepts of general systems theory.

In GST, *systems* are conceptualized of as collections of entities that influence each other and change as a whole. Virtually all systems of concern to human service professionals are open systems, which are understood in terms of three primary stages of activity: input, process, and output (see *figure 1.1*). (i) Systems, whether of individuals or organizations, regularly take in