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Dorothy Johnson: Behavioral System Model

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Dorothy E. Johnson (1919–1999)

"All of us, scientists and practicing professionals, must turn our attention to practice and ask questions of that practice. We must be inquisitive and inquiring, seeking the fullest and truest possible understanding of the theoretical and practical problems we encounter."

(Johnson, 1976)

CREDENTIALS AND BACKGROUND OF THE THEORIST

Dorothy E. Johnson was born on August 21, 1919, in Savannah, Georgia. She received her associate's degree from Armstrong Junior College in Savannah, Georgia (1938), her bachelor of science degree in nursing from Vanderbilt University in Nashville, Tennessee (1942), and her master's of public health degree from Harvard University in Boston (1948).

Johnson's professional experiences involved mostly teaching, although she was a staff nurse at the Chatham-Savannah Health Council from 1943 to 1944. She was an instructor and an assistant professor in pediatric nursing at Vanderbilt University School of Nursing. From 1949 until her retirement in 1978 and her subsequent move to Key Largo, Florida, Johnson was an assistant professor of pediatric nursing, an associate professor of nursing, and a professor of nursing at the University of California in Los Angeles.

In 1955 and 1956, Johnson was a pediatric nursing advisor assigned to the Christian Medical College School of Nursing in Vellore, South India. From 1965 to 1967, she served as chairperson on the committee of the California Nurses Association that developed a position statement on specifications for the clinical specialist. Johnson's publications include four books; more than 30 articles in periodicals; and many papers, reports, proceedings, and monographs (Johnson, 1980).

Of the many honors she received, Johnson (personal communication, 1984) was proudest of the 1975 Faculty Award from graduate students, the 1977 Lulu Hassenplug Distinguished Achievement Award from the California Nurses Association, and the 1981 Vanderbilt University School of Nursing Award for Excellence in Nursing. She died in February 1999 at 80 years of age. She was pleased that her behavioral system model had been found useful in furthering the development of a theoretical basis for nursing and was being used as a model for nursing practice on an institution-wide basis, but she reported that her greatest source of satisfaction came from following the productive careers of her students (D. Johnson, personal communication, 1996).

THEORETICAL SOURCES

Johnson's behavioral system model was heavily influenced by Florence Nightingale's book, *Notes on Nursing* (Johnson, 1992). Johnson began her work on the model with the premise that nursing was a profession that made a distinctive contribution to the welfare of society. Thus nursing had an explicit goal of action in patient welfare. Her task was to clarify the social mission of nursing from the "perspective of a theoretically sound view of the person we serve" (Johnson, 1977). She accepted Nightingale's belief that the first concern of nursing is with the "relationship

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between the person who is ill and their environment, not with the illness" (Johnson, 1977). Johnson (1977) noted that the "transition from this approach to the more sophisticated and theoretically sounder behavioral system orientation took only a few years and was supported by both my own, and that of many colleagues, growing knowledge about man's action systems and by the rapidly increasing knowledge about behavioral systems." Johnson (1977) came to conceive of nursing's specific contribution to patient welfare as that of fostering "efficient and effective behavioral functioning in the person, both to prevent illness and during and following illness."

Johnson used the work of behavioral scientists in psychology, sociology, and ethnology to develop her theory. The interdisciplinary literature that Johnson cited focused on observable behaviors that were of adaptive significance. This body of literature influenced the identification and the content of her seven subsystems. Talcott Parsons is acknowledged specifically in early developmental writings presenting concepts of the Johnson behavioral system model (Johnson, 1961a). Parsons' (1951, 1964) social action theory stressed a structural-functional approach. One of his major contributions was to reconcile functionalism (the idea that every observable social behavior has a function to perform) with structuralism (the idea that social behaviors, rather than being directly functional, are expressions of deep underlying structures in social systems). Thus structures (social systems) and all behaviors have a function in maintaining them. The components of the structure of a social system—goal, set, choice, and behavior—are the same in Parsons' and Johnson's theories.

Johnson also relied heavily on system theory and used concepts and definitions from Rapoport, Chin, von Bertalanffy, and Buckley (Johnson, 1980). In system theory, as in Johnson's theory, one of the basic assumptions embraces the concept of order. Another is that a system is a set of interacting units that form a whole intended to perform some function. Johnson conceptualized the person as a behavioral system in which the behavior of the individual as a whole is the focus. It is the focus on what the individual does and why. One of the strengths of the Johnson behavior system theory is the consistent integration of concepts defining behavioral systems drawn from general systems theory. Some of these concepts include holism, goal seeking, interrelationship/interdependency, stability, instability, subsystems, regularity, structure, function, energy, feedback, and adaptation.

Johnson noted that although the literature indicates that others support the idea that a person is a behavioral system and that a person's specific response patterns form an organized and integrated whole, the idea was original with her as far as she knew. Just as the development of knowledge of the whole biological system was preceded by knowledge of the parts, the development of knowledge of behavioral systems was focused on specific behavioral responses. Empirical literature supporting the notion of the behavioral system as a whole and its usefulness as a framework for nursing decisions in research, education, and nursing practice has accumulated since it was introduced (Benson, 1997; Derdiarian, 1991; Grice, 1997; Holaday, 1981, 1982; Holaday et al., 1996; Lachicotte & Alexander, 1990; Martha et al., 2004; Oyedele et al., 2013; Poster et al., 1997; Turner-Henson, 1992; Wang & Palmer, 2010; Wilmoth, 2007; Wilmoth & Ross, 1997).

Developing the behavioral system model from a philosophical perspective, Johnson (1980) wrote that nursing contributes by facilitating effective behavioral functioning in the patient before, during, and after illness. She used concepts from other disciplines, such as social learning, motivation, sensory stimulation, adaptation, behavioral modification, change process, tension, and stress, to expand her theory for the practice of nursing.

USE OF EMPIRICAL EVIDENCE

The empirical origins of this theory begin with Johnson's use of systems thinking (synthesis). This process concentrates on the function and behavior of the whole and is focused on an understanding and explanation of the behavioral system. Johnson's work on the behavioral system model corresponded with the "systems age." Buckley's (1968) seminal text was published the same year Johnson formally presented her theory at Vanderbilt University.

System theory, as a basic science, deals on an abstract level with the general properties of systems regardless of physical form or domain of application. General system theory was founded on the assumption that all kinds of systems had characteristics in common regardless of their internal nature. Johnson used general system theory and systems thinking to bring together a body of theoretical constructs, as well as explaining their interrelationships, to identify and describe the mission of nursing. The Johnson behavioral system model provided a framework that is based on her synthesis of the component parts of this system and a description of the context of relationships with one another (subsystems) and with other systems (environment). Standing in contrast to scientific reductionism, Johnson proposed to view nursing in a holistic manner—a behavioral system. Consistent with system theory, the Johnson behavioral system model provides an understanding of a system by examining the linkages and interactions between the elements that compose the entirety of the system. The paragraphs that follow describe how Johnson incorporated empirical knowledge from other disciplines into the Johnson behavioral system model.

Concepts Johnson identified and defined in her theory are supported in the literature. She noted that Escalona and Leitch agreed that tension produces behavioral changes and that the manifestation of tension by an individual depends on both internal and external factors (Johnson, 1980). Johnson (1959a) used the work of Selye, Grinker, Simmons, and Wolff to support the idea that specific patterns of behavior are reactions to stressors from biological, psychological, and sociological sources, respectively. Johnson (1961b) suggested a difference in her model from Selye's conception of stress. Johnson's concept of stress "follows rather closely Caudill's conceptualization; that is, that stress is a process in which there is interplay between various stimuli and the defenses erected against them. Stimuli may be positive in that they are present, or negative in that something desired or required is absent" (Johnson, 1961a, p. 7). Selye "conceives stress as 'a state' manifested by the specific syndrome which consists of all the nonspecifically induced changes within a biologic system" (Johnson, 1961a, p. 7).

In *Conceptual Models for Nursing Practice,* Johnson (1980) described seven subsystems that make up her behavioral system. To support the attachment-affiliative subsystem, she cited the work of Ainsworth and Robson. Heathers, Gerwitz, and Rosenthal have described and explained dependency behavior, another subsystem defined by Johnson. The response systems of ingestion and elimination, as described by Walike, Mead, and Sears, are also parts of Johnson's behavioral system. The work of Kagan and Resnik were used to support the sexual subsystem. The aggressive-protective subsystem, which functions to protect and preserve, is supported by Lorenz and Feshbach (Feshbach, 1970; Johnson, 1980; Lorenz, 1966). According to Atkinson, Feather, and Crandell, physical, creative, mechanical, and social skills are manifested by achievement behavior, another subsystem identified by Johnson (1980).

The restorative subsystem was developed by faculty and clinicians to include behaviors such as sleep, play, and relaxation (Grubbs, 1980). Although Johnson (personal communication, 1996) agreed that "there may be more or fewer subsystems" than originally identified, she did not support **restorative** as a subsystem of the behavioral system model. She believed that sleep is primarily a biological force, not a motivational behavior. She suggested that many of the behaviors identified in infants during their first years of life, such as play, are actually achievement behaviors. Johnson (personal communication, 1996) stated that there was a need to examine the possibility of an eighth subsystem that addresses explorative behaviors; further investigation may delineate it as a subsystem separate from the achievement subsystem.

MAJOR CONCEPTS & DEFINITIONS

Behavior

Johnson accepted the definition of behavior as expressed by behavioral and biological scientists—that is, the output of intraorganismic structures and processes as they are coordinated and articulated by and responsive to changes in sensory stimulation. Johnson (1980) focused on behavior affected by the actual or implied presence of other social beings that has been shown to have major adaptive significance.

System

Using Rapoport's 1968 definition of system, Johnson (1980) stated, "A system is a whole that functions as a whole by virtue of the interdependence of its parts" (p. 208). She accepted Chin's statement that there is "organization, interaction, interdependency, and integration of the parts and elements" (Johnson, 1980, p. 208). In addition, a person strives to maintain a balance in these parts through adjustments and adaptations to the impinging forces.

Behavioral System

A behavioral system encompasses the patterned, repetitive, and purposeful ways of behaving. These ways of behaving form an organized and integrated functional unit that determines and limits the interaction between the person and his or her environment and establishes the relationship of the person to the objects, events, and situations within his or her environment. Usually the behavior can be described and explained. A person as a behavioral system tries to achieve stability and balance by adjustments and adaptations that are successful to some degree for efficient and effective functioning. The system is usually flexible enough to accommodate the influences affecting it (Johnson, 1980).

Subsystems

The behavioral system has many tasks to perform; therefore parts of the system evolve into subsystems with specialized tasks. A subsystem is "a minisystem with its own particular goal and function that can be maintained as long as its relationship to the other subsystems or the environment is not disturbed" (Johnson, 1980, p. 209). The seven subsystems identified by Johnson are open, linked, and interrelated. Input and output are components of all seven subsystems (Grubbs, 1980).

MAJOR CONCEPTS & DEFINITIONS—cont'd

Motivational drives direct the activities of these subsystems, which are continually changing through maturation, experience, and learning. The systems described appear to exist cross-culturally and are controlled by biological, psychological, and sociological factors. The seven identified subsystems are **attachment-affiliative, dependency, ingestive, eliminative, sexual, achievement,** and **aggressive-protective** (Johnson, 1980).

Attachment-Affiliative Subsystem

The attachment-affiliative subsystem is probably the most critical because it forms the basis for all social organization. On a general level, it provides survival and security. Its consequences are social inclusion, intimacy, and formation and maintenance of a strong social bond (Johnson, 1980).

Dependency Subsystem

In the broadest sense, the dependency subsystem promotes helping behavior that calls for a nurturing response. Its consequences are approval, attention or recognition, and physical assistance. Developmentally, dependency behavior evolves from almost total dependence on others to a greater degree of dependence on self. A certain amount of interdependence is essential for the survival of social groups (Johnson, 1980).

Ingestive Subsystem

The ingestive and eliminative subsystems should not be seen as the input and output mechanisms of the system. All subsystems are distinct subsystems with their own input and output mechanisms. The ingestive subsystem "has to do with when, how, what, how much, and under what conditions we eat" (Johnson, 1980, p. 213). "It serves the broad function of appetitive satisfaction" (Johnson, 1980, p. 213). This behavior is associated with social, psychological, and biological considerations (Johnson, 1980).

Eliminative Subsystem

The eliminative subsystem addresses "when, how, and under what conditions we eliminate" (Johnson, 1980, p. 213). As with the ingestive subsystem, the social and psychological factors are viewed as influencing the biological aspects of this subsystem and may be, at times, in conflict with the eliminative subsystem (Loveland-Cherry & Wilkerson, 1983).

Sexual Subsystem

The sexual subsystem has the dual functions of procreation and gratification. Including, but not limited to, courting and mating, this response system begins with the development of gender role identity and includes the broad range of sex-role behaviors (Johnson, 1980).

Achievement Subsystem

The achievement subsystem attempts to manipulate the environment. Its function is control or mastery of an aspect of self or environment to some standard of excellence. Areas of achievement behavior include intellectual, physical, creative, mechanical, and social skills (Johnson, 1980).

Aggressive-Protective Subsystem

The aggressive-protective subsystem's function is protection and preservation. This follows the line of thinking of ethologists such as Lorenz (1966) and Feshbach (1970) rather than the behavioral reinforcement school of thought, which contends that aggressive behavior is not only learned, but also has a primary intent to harm others. Society demands that limits be placed on modes of self-protection and that people and their property be respected and protected (Johnson, 1980).

Equilibrium

Johnson (1961a) stated that equilibrium is a key concept in nursing's specific goal. It is defined as "a stabilized but more or less transitory, resting state in which the individual is in harmony with himself and with his environment" (p. 5). "It implies that biological and psychological forces are in balance with each other and with impinging social forces" (Johnson, 1961a, p. 6). It is "not synonymous with a state of health, since it may be found either in health or illness" (Johnson, 1961a, p. 6).

Functional Requirements and Sustenal Imperatives

For the subsystems to develop and maintain stability, each must have a constant supply of **function requirements**. The environment supplies sustenal imperatives such as protection, nurturance, and stimulation. Johnson notes that the biologic system and all other living systems have the same requirements.

Regulation/Control

The interrelated behavioral subsystems must be regulated in some fashion so that its goals can be realized. **Regulation** implies that deviations will be detected and corrected. Feedback is, therefore, a requirement of effective control. There is self-regulation by the client. The nurse can also act as a temporary external regulatory force to preserve the organization and integration of the client's behavior at an optimal level in situations of illness

Continued

MAJOR CONCEPTS & DEFINITIONS—cont'd

or under conditions where behavior constitutes a threat to health.

Tension

"The concept of **tension** is defined as a state of being stretched or strained and can be viewed as an end-product of a disturbance in equilibrium" (Johnson, 1961b, p. 7). Tension can be constructive in adaptive change or destructive in inefficient use of energy, hindering adaptation and causing potential structural damage (Johnson, 1961b). Tension is the cue to disturbance in equilibrium (Johnson, 1961a).

Stressor

Internal or external stimuli that produce tension and result in a degree of instability are called stressors. "Stimuli may be positive in that they are present; or negative in that something desired or required is absent. [Stimuli] ... may be either endogenous or exogenous in origin [and] may play upon one or more of our linked open systems" (Johnson, 1961a, p. 7). The open-linked systems are in constant interchange. The open-linked systems include the physiological, personality, and meaningful small group (the family) systems and the larger social system (Johnson, 1961a).

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MAJOR ASSUMPTIONS

Nursing

Nursing's goal is to maintain and restore the person's behavioral system balance and stability or to help the person achieve a more optimum level of balance and functioning. Thus nursing, as perceived by Johnson, is an external force acting to preserve the organization and integration of the patient's behavior to an optimal level by means of imposing temporary regulatory or control mechanisms or by providing resources while the patient is experiencing stress or behavioral system imbalance (Brown, 2006). An art and a science, nursing supplies external assistance both before and during system balance disturbance and therefore requires knowledge of order, disorder, and control (Herbert, 1989; Johnson, 1980). Nursing activities do not depend on medical authority, but they are complementary to medicine.

Person

Johnson (1980) viewed the person as a behavioral system with patterned, repetitive, and purposeful ways of behaving that link the person with the environment. The conception of the person is basically a motivational one. This view leans heavily on Johnson's acceptance of ethology theories, that innate, biological factors influence the patterning and motivation of behavior. She also acknowledged that prior experience, learning, and physical and social stimuli also influence behavior. She noted that a prerequisite to using this model is the ability to look at a person as a behavioral system, observe a collection of behavioral subsystems, and be knowledgeable about the physiological, psychological, and sociocultural factors operating outside them (class notes, 1971).

Johnson identified several assumptions that are critical to understanding the nature and operation of the person as a behavioral system. We assume that there is organization, interaction, and interdependency and integration of the parts of behavior that make up the system. An individual's specific response patterns form an organized and integrated whole. The interrelated and interdependent parts are called **subsystems**. Johnson (1977) further assumed that the behavioral system tends to achieve balance among the various forces operating within and upon it. People strive continually to maintain a behavioral system balance and steady states by more or less automatic adjustments and adaptations to the natural forces impinging upon them. Johnson also recognized that people actively seek new experiences that may temporarily disturb balance.

Furthermore, Johnson (1977, 1980) assumed that a behavioral system, which both requires and results in some degree of regularity and constancy in behavior, is essential to human beings. Finally, Johnson (1977) assumed that behavioral system balance reflected adjustments and adaptations by the person that are successful in some way and to some degree. This will be true, even though the observed behavior may not always match the cultural norms for acceptable or health behavior.

Balance is essential for effective and efficient functioning of the person. Balance is developed and maintained within the subsystems(s) or the system as a whole. Changes in the structure or function of a system are related to problems with drive, lack of functional requirements or sustenal imperatives, or a change in the environment. A person's attempt to reestablish balance may require an extraordinary expenditure of energy that leaves a shortage of energy to assist biological processes and recovery.

Health

Johnson perceived health as an elusive, dynamic state influenced by biological, psychological, and social factors. Health is reflected by the organization, interaction, interdependence, and integration of the subsystems of the behavioral system (Johnson, 1980). An individual attempts to achieve a balance in this system, which will lead to functional behavior. A lack of balance in the structural or functional requirements of the subsystems leads to poor health. Thus when evaluating "health," one focuses on the behavioral system and system balance and stability, effective and efficient functioning, and behavioral system imbalance and instability. The outcomes of behavior system balance are that (1) a minimum expenditure of energy is required (implying more energy is available to maintain health, or, in the case of illness, energy is available for the biological processes needed for recovery); (2) continued biologic and social survival are ensured; and (3) some degree of personal satisfaction accrues (Grubbs, 1980; Johnson, 1980).

Environment

In Johnson's theory, the environment consists of all the factors that are not part of the individual's behavioral system, but that influence the system. The nurse may manipulate some aspects of the environment so the goal of health or behavioral system balance can be achieved for the patient (Brown, 2006).

The behavioral system "determines and limits the interaction between the person and their environment and establishes the relationship of the person to the objects, events and situations in the environment" (Johnson, 1978). Such behavior is orderly and predictable. It is maintained because it has been functionally efficient and effective most of the time in managing the person's relationship to the environment. It changes when this is no longer the case, or when the person desires a more optimum level of functioning. The behavioral system has many tasks and missions to perform in maintaining its own integrity and in managing the system's relationship to its environment.

The behavioral system attempts to maintain equilibrium in response to environmental factors by adjusting and adapting to the forces that impinge on it. Excessively strong environmental forces disturb the behavioral system balance and threaten the person's stability. An unusual amount of energy is required for the system to reestablish equilibrium in the face of continuing forces (Loveland-Cherry & Wilkerson, 1983).

The environment is also the source of the sustenal imperatives of protection, nurturance, and stimulation that are necessary prerequisites to maintain health (behavioral system balance; Grubbs, 1980). When behavioral system imbalance (disequilibrium) occurs, the nurse may need to become the temporary regulator of the environment and provide the person's supply of functional requirements so the person can adapt to stressors. The type and the amount of functional requirements needed vary by age, gender, culture, coping ability, and type and severity of illness.

THEORETICAL ASSERTIONS

The Johnson behavioral system theory addresses the metaparadigm concepts of **person, environment,** and **nursing.** The person is a behavioral system with seven interrelated subsystems (Fig. 18.1). Each subsystem is formed from a set of behavioral responses, or responsive tendencies, or action systems that share a common drive or goal. Organized around drives (some type of intraorganismic motivational structure), these responses are differentiated, developed, and modified over time through maturation, experience, and learning. They are determined developmentally and are continuously governed by a multitude of physical, biological, and psychological factors operating in a complex and interlocking fashion.

Each subsystem is described and analyzed in terms of structural and functional requirements. The four structural elements that have been identified include (1) drive or goal—the ultimate consequence of behaviors in it; (2) set—a tendency or predisposition to act in a certain way—which is subdivided into two types, **preparatory,** or what a person usually attends to, and **perseverative,** the habits one maintains in a situation; (3) choice, which represents the behavior a patient sees himself or herself as being able to use in any given situation; and (4) action or the behavior of an individual (Grubbs, 1980; Johnson, 1980). Set plays a major role both in the choices a person considers and in his or her ultimate behavior. Each of the seven subsystems has the same three functional requirements: (1) protection, (2) nurturance, and (3) stimulation. These functional requirements must be met through the person's own efforts, or with the outside assistance of the nurse. For the subsystems to develop and maintain stability, each must have a constant supply of functional requirements (sustenal imperatives) that are usually supplied by the environment. However, during illness or when the potential for illness poses a threat, the nurse may become a source of functional requirements.

The responses by the subsystems are developed through motivation, experience, and learning and are influenced by biological, psychological, and social factors (Johnson, 1980). The behavioral system attempts to achieve balance by adapting to internal and environmental stimuli. The behavioral system is made up of "all the patterned, repetitive, and purposeful ways of behaving that characterize