Reconceptualization of the Uncertainty in Illness Theory

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The theory of uncertainty in illness has its strongest support among subjects who are experiencing the acute phase of illness or are in a downward illness trajectory (Mishel, 1988a). The theory has not addressed the experience of living with continual, constant uncertainty in either a chronic illness or in an illness with a treatable acute phase and possible eventual recurrence. Since uncertainty characterizes many, most prevalent, long-term illness conditions, there is a need to reconceptualize the theory of uncertainty to include the experience of living with continual uncertainty. A close examination of the theoretical statements and the empirical data reported by Mishel resulted in the identification of areas of the theory that could be expanded and reconceptualized. The reconceptualization effort was primarily fueled by questions about the outcome portion of the uncertainty theory. To provide a context for the expansion and reconceptualization of uncertainty, applicable parts of the theory are summarized below.

Uncertainty is the inability to determine the meaning of illness-related events and occurs in situations where the decision maker is unable to assign definite values to objects and events and/or is unable to accurately predict outcomes because sufficient cues are lacking (Mishel, 1988a). The uncertainty theory explains how patients cognitively process illness-related stimuli as well as how they structure meaning for those events. Figure 1 shows the uncertainty framework and is structured to depict the time ordering of the variables. In the outcome portion of the theory, although uncertainty refers to important concerns, it is not considered to be a dreaded or a desired state until the implications of the uncertainty are determined. Because uncertainty indicates the situation if vague and ill defined, there is the potential for many diverse evaluations and conclusions about the uncertainty.

In the uncertainty theory, there are two appraisal processes used to determine the value placed upon the uncertainty— inference and illusion. Both processes can be fostered by the patient, their social resources and health care providers. Inference refers to the evaluation of uncertainty based on examples of related situations. If the inferences are seen as positive, then the uncertainty will be appraised as an opportunity. If the inferences are seen as threatening then the uncertainty will be appraised as a danger.

Illusion refers to the construction of beliefs that have a generally positive outlook. Illusions allow the uncertainty to be evaluated as indicating the potential for a positive outcome. Because of the vague and amorphous nature of uncertainty, events can be reformed by the person into an illusion indicating a positive situation. Illusion generation is proposed as being used only in situations with a negative trajectory. In other words, when an illness has a certain downward course, any uncertain aspect of the illness is, through illusion generation, evaluated as positive.

If uncertainty is appraised as a danger, there is an expectation of a harmful outcome resulting in the activation of coping strategies to reduce the uncertainty. If uncertainty is inferred to be an opportunity, a positive outcome is implied, and coping strategies to maintain the uncertainty are implemented. In an opportunity appraisal of uncertainty, the uncertainty must be maintained because its continuation is necessary for a positive view of the situation to remain viable. If the coping strategies used in either appraisal are effective, then adaptation will occur. Signs of difficulty in adapting do not refer to the uncertainty itself but to the ability of the coping strategies to manipulate the uncertainty in the desired direction; that is, to reduce it if it is appraised to be a danger or to maintain it if it is appraised to be an opportunity.

Questions about the Theory

Questions about the theory emerged from an examination of the role of uncertainty in Western society. To understand fully the concept of uncertainty, it was necessary to consider how uncertainty is viewed in our culture. Such an assessment allows the identification of cultural biases in the conceptualization. Using the perspective of critical social theory, uncertainty was considered in the context of cultural themes and the cultural ideal of coherence and
order in intrapersonal and interpersonal systems. The perspective of critical social theory is to raise questions about the underlying social values that support major conceptualizations in science and practice (Allen, 1985). It is a method by which the "established" views of the world are questioned (Thompson, 1987). The basic questions asked concerning uncertainty were "Why does the patient continue to seek certainty?" "Why is certainty held in such high value in this society?" "Is the promotion of the goals of control, predictability and certainty the result of the sociohistoric values of this society?"

A parallel, although not a precise one, between the nature of society and the reigning scientific world view has been posited by Sampson (1989). As a continuation of the mechanistic orientation that characterized classical science and the rise of the factory/consumer society, the Western world portrays events as produced by specific conditions that in principle are determinable with precision (Toffler, 1984). The concept of rationality in this society is grounded in a mechanistic view of life (Sampson, 1988). This view of life has no place for chance or uncertainty. Uncertainty is feared and accuracy is valued. With predictability and control as major social values, persons will proceed with culturally approved behaviors in the belief that desired outcomes will be gained (Sampson, 1985). The values of predictability, control and certainty can function to restrict the variation in behavior in the society. Individuals take the paths that are promulgated as leading to obtainable secure outcomes; they pursue certainty.

Psychological theory supports this mechanistic orientation by placing emphasis on concepts such as internal/external control, self-efficacy and learned resourcefulness. The orientation of psychology is toward the enhancement of the person's ability to obtain stable, sure outcomes by the instigation of specific internally driven causal behaviors. Belief in the desirability of certain goals and in their obtainability through specific acts is seen as the natural view of life in this industrialized, consumer-oriented society. The cultural ideal is of an equilibrium concept of personhood in which order will characterize the individual's life and the functioning of interpersonal systems (Sampson, 1985). Order and coherence are viewed as being maintained through emphasis on seeking control and predictability.

The value of predictability, control and mastery as the natural and normal way of life is also seen in the health care setting, particularly in the mechanistic orientation of medicine. Medical science, like all fields of science, does not function separately from the major values of society (Toffler, 1984). The expectation in medicine, as in the broader society, is that specific actions will lead to desirable and obtainable outcomes. Much effort, energy and expense is put into the development of technology that will identify the specific causes of illness and the specific treatment that will cause the desired outcome—a cure (Bursztajen, Feinbloom, Hamm & Brodsky, 1981). There is the expectation the cause of illness can be determined with certainty and the illness can be controlled. The goal is to return the person to equilibrium; non-equilibrium is seen as breakdown.

The only information that is treated as valid is hard, scientific, objective data (Bursztajen et al., 1981). The primary source of valid information is under the control of the physician; the patient and physician both share this orientation. The expectation is that cause and effect can be determined, and success is judged by the degree to which this goal is achieved. Failure at achieving this is seen as physician failure, and all attempts are to avert such a disastrous outcome. Certainty, control and predictability are the desired outcomes; uncertainty is seen as deficient and attempts are to avoid it or to cast it as a temporary situation. Based on this view of uncertainty in the broader society and in the illness situation, uncertainty has the potential to disrupt the person's sense of control and direction of life as well as to jeopardize the structure of equilibrium.

From this examination of the cultural attitude toward the experience of uncertainty, it is apparent the present conceptualization of uncertainty reflects cultural bias of a preference for certainty and an orientation to the achievement of equilibrium as a goal-state. This cultural bias is reflected in three concerns: implicit assumptions of the theory, conflicting research findings and blocks to advancing the theory.

**Implicit Assumptions**

In the uncertainty theory, adaptation—psychosocial behavior within the person's normative level of functioning—is proposed as the end state achieved after coping with the uncertainty. Adaptation as the end state is consistent with the cultural preference for achievement of personal order through attainment of equilibrium. The question that becomes apparent is, if a person were to learn how to manage the uncertainty surrounding illness, why should this be conceptualized as achieving stability within the pre-illness level of functioning? The orientation to stability and adaptation in the present theory does not allow for the conceptualization of growth and change following the experience of uncertainty. In an acute illness situation, learning how to manage the uncertainty results in the incorporation of this experience into the new level of self-organization and so is not a return to a previously existing level of function but includes the growth resulting from the current experience. In long-term uncertainty, where the uncertainty can't be managed and persons must live with enduring uncertainty, perhaps a new state can be achieved that evolves from what previously existed.

The idea that managing short-term uncertainty and living with continual uncertainty may result in personal growth leads to consideration of how the person's experience of uncertainty could shift over time. Since the model and theory do not address the issue of temporal variability, there is no consideration of the nonlinear impact of antecedent variables such as health care providers and social supports on the appraisal of uncertainty over time. As many illnesses have a long-term effect on individual lives, theories to explain illness-related phenomena need to include a perspective that illustrates how the phenomena evolve over time. This lack of attention to change reflects the cultural bias toward stability and control. Little attention is given in psychological theories toward exchange between the system and the environment or to irreversible processes. In qualitative investigations of uncertainty it was found the longer chronically ill subjects lived with continual uncertainty, the more positively they evaluated the uncertainty (King & Mishel, 1986). This implies the appraisal of uncertainty evolves over time, which is not accounted for in the uncertainty theory.
Conflicting Findings

In the original theory, the appraisal of uncertainty as an opportunity is expected to occur only when the situation is one with a high probability of negative uncertainty, an illness situation with a known downward trajectory. The explanation for uncertainty being appraised as an opportunity in such situations is logical since, when the alternative is negative certainty, uncertainty becomes a preferable state. Limiting a positive evaluation of uncertainty to a situation in which the certain outcome indicates progressive deterioration or death reflects the cultural value that uncertainty is an aversive experience and, except in an extreme situation, is definitely not preferable to certainty. Although there are findings to support the theory (Capritto, 1980; Pergrin, Mishel & Murdaugh, 1987; Yarcheski, 1988), there are other findings from research based on persons with long-term chronic illnesses without a downward trajectory that show uncertainty appraised as a desirable state (King & Mishel, 1986; Mishel & Murdaugh, 1987; Mishel, 1988b). Since these findings conflict with the theory, the theory needs to be expanded to account for the existence of preferable uncertainty in situations other than those characterized by negative certainty.

Theoretical Blocks

The final concern centers on the appraisal-coping section of the original theory. In the model, opportunity and danger are parallel to each other, indicating the patient chooses one and only one path. Although this may be appropriate for certain clinical situations, it may not accurately reflect the fluctuations that occur over the course of illness and may not consider the long-term illness situation. Over time, an appraisal of uncertainty as a danger may evolve into appraisal of uncertainty as a positive experience. Selection of only one type of appraisal negates the notion of appraisal as a process that fluctuates over time. Instead, the theory reflects a mechanistic orientation to a specific state and not a process. Here, too, the theory needs reformulation to address the appraisal of uncertainty as an evolving process.

Based on these questions and concerns, the task of reformulating the theory was not to disregard the existing theoretical statements and linkages but to expand them to account for a perspective of growth and self-organization as being the outcome of coping with uncertainty instead of an equilibrium-stability view of adaptation. The expansion of the theory is done to incorporate the themes of (a) change over time, (b) evolution in the appraisal of uncertainty, (c) emphasis on the person as an open system interchanging energy with the environment and (d) an orientation toward increased complexity rather than an equilibrium ideal. The reconceptualization effort is directed primarily toward expanding the uncertainty theory to increase its applicability to the experience of persons living in Western society under conditions where (a) uncertainty is a continual experience that extends over years and (b) the illness is either chronic with remissions and exacerbations or potentially life threatening following a treatable acute phase with an unknown possibility of recurrence or extension.

Reconceptualization Approach

The approach to reformulation of the uncertainty theory used the process of theory derivation as described by Walker and Avant (1989) to identify a parent theory that addressed the four themes identified as the focus for the expansion of the theory. Walker and Avant define theory derivation as "the process of using analogy to obtain explanations or predictions about phenomenon in one field from the explanations or predictions in another field" (p. 163). The theory derivation process includes the steps of noting similar dimensions of a phenomenon in field one and redefining the information from field one to field two. Redefinition is accomplished in a way that is compatible with and advances the understanding of the phenomenon in field two. However, identifying relevant theory and making the analogy require creativity, imagination and intensive concentration to conceptualize the rationale for the transposition of concepts and structure. Because the task was not to gain knowledge about a new topic but to clarify the aspects of the uncertainty theory targeted for modification, the theory derivation activity undertaken was somewhat different than that just described.

Chaos theory was selected as the parent theory because it deals with open systems and is therefore able to address the relationship between systems and their interaction with the outside forces. Chaos theory also speaks to the activities of a system when the system is outside its usual routine functioning. As Walker and Avant (1989) note, the theorist is free to select the parts of the theory that best fit the needs of the formulation. Therefore, selected aspects of the content and structure of the theory were used as the basis for derivation.

Chaos Theory

The concepts in chaos theory differ from the traditional focus of science on stability, order, uniformity, equilibrium and concern with closed systems and linear relationships; chaos theory shifts attention to disorder, instability, diversity, disequilibrium, nonlinear relationships and temporality, which are part of the healthy variability of a system (Pool, 1989). Chaos was described by Pool as "deterministic randomness" because, even though a system may stay within certain limits, its behavior can appear random. According to Pool, chaos is deterministic because it is generated from intrinsic causes and not from extraneous noise; randomness refers to the irregular and complex behavior that is demonstrated by the system. Chaos theory deals with concepts such as far-from-equilibrium systems, critical values, nonlinear transformations and bifurcation points. According to chaos theory, Prigogine and Stengers (1984) stressed all systems contain subsystems that are continually fluctuating. At times

FIGURE 1 Outcome portion of the uncertainty in Illness model
a single fluctuation or a combination of them can become so powerful through feedback mechanisms within the system that they shatter the organization of the system. As Pool suggested chaotic processes are complicated and unpredictable; yet they result deterministically from the way the system regulates its process rather than from random fluctuations. Chaos provides a healthy variability in a system's response to a variety of stimuli.

Although changes can occur in systems that are near equilibrium, it is the far-from-equilibrium systems that are the focus here. In far-from-equilibrium conditions, the sensitivity of the initial condition is such that small changes yield huge effects, and the system reorganizes itself in multiple ways. Fluctuations in the system can become so powerful that they shatter the preexisting organization. In cases where instability is possible, one has to determine the distance or threshold at which fluctuations exceed the critical value to lead to new behavior. Fluctuations may lie below or above a critical value. In some situations critical value is influenced by communication with the outside world and can, depending on that communication, be destroyed or can spread throughout the entire system (Prigogine & Stengers, 1984).

One of the conditions that promotes the growth of a fluctuation within a system and possess the seeds of chaos is the positive feedback process of non-linear reactions. In these reactions, the reaction product has a feedback action on itself (Brent, 1978). These auto-catalytic processes result in a product whose presence encourages further production of itself. In this way it is possible to force the system into the chaotic regime by augmenting the concentration of the fluctuation through increasing the value of the parameter of the positive feedback. As the fluctuations gain in strength, entropy is produced.

Entropy in chaos theory refers to the degree of disorder or disorganization in the system. The production of entropy is calculated from the degree of flux (fluctuation) and the forces. As this entropy increases, it may surpass the ability of the system to integrate the disorder. If the fluctuation exceeds the critical value, the threshold of stability or bifurcation point is reached. At the bifurcation point, the system becomes unstable in respect to fluctuations. It is unknown where the system will go when it reaches bifurcation, although this can be influenced by the history of the system as well as by boundary conditions such as temperature or concentration of chemical substances within a system. Also, the type of fluctuation in the system will affect the choice of bifurcation branch the system may follow. External fields are another source of influence on the behaviors available to far-from-equilibrium systems since such systems are highly sensitive to fluctuations in the environment (Nicolis & Prigogine, 1977).

At the point of bifurcation, although the system appears highly unstable with giant fluctuations, instability is only at the macroscopic level. At the microscopic level the fluctuations show patterning that evolves toward a new position. In what appears to be random, an "attractor" functions like a magnet for the fluctuations and causes the patterning (Gleick, 1987); a process of self-organization occurs (Prigogine & Stengers, 1984). According to Prigogine and Stengers entropy is seen as the progenitor of order. The giant fluctuation causing the entropy is stabilized through energy exchanges with the outside world, which, in turn, influences the new level of stabilization or self-organization. The interaction of the system with the outside world may become the starting point for the formation of dissipative structures. Dissipative structures are new forms of organization that maintain themselves by dissipating their disorder into the external world in exchange for order. All dissipative structures are a reflection of the disequilibrium producing them. Out of disorder rises order.

**Chaos Theory and Uncertainty in Illness**

According to chaos theory, activity leading to new levels of self-organization occurs within systems that are far-from-equilibrium. Because such systems are open, exchanging both energy and matter with the environment (Brent, 1978), most biological and social systems fit the definition of far-from-equilibrium systems. Chaos theory states that whether chaos will be evidenced depends on the initial condition within a system. In far-from-equilibrium systems, fluctuations in the system function to enhance the system's receptivity to change. In the application of chaos theory to uncertainty in illness, it is proposed the uncertainty surrounding a chronic or life-threatening condition qualifies as a sufficient fluctuation to threaten the preexisting organization of the person, a far-from-equilibrium system.

Within the confines of illness, frequent concerns are uncertainty about the severity of the illness, uncertainty about the success of treatment, uncertainty about the impact of the illness on one's life and uncertainty about the ability to pursue life's dreams and ambitions. In a life-style organized around enhancing predictability and control, uncertainty has been found to prevent the person from having the information necessary for controlling events (Staub & Keeleit, 1972; Staub, Tursky & Schwartz, 1971). In clinical studies, uncertainty has been disruptive of important life areas (Mishel, Hostetter, King & Graham, 1984) and associated with psychological distress (Mishel, 1988b). Uncertainty has been found to reduce the person's sense of mastery over the events, to enhance the sense of danger (Mishel, 1988b) and to weaken the level of learned resourcefulness (Braden, 1990). Both clinical and laboratory studies indicate that uncertainty is an aversive experience for persons oriented toward the enhancement of predictability for achieving control.

Uncertainty in illness is viewed as a fluctuation that begins in only one part of the human system and according to chaos theory, can either regress and cause no particular disruption or spread to the whole system. As uncertain disease related or illness related factors are introduced into the person's life the uncertainty competes with the person's previous mode of functioning. If individuals could contain the uncertainty so it did not invade multiple aspects of their lives, the uncertainty would not be sufficient to disrupt an on-going life pattern. But if aspects of uncertainty were to multiply so rapidly they invaded significant aspects of the person's being and life, then the impact of the uncertainty would move the person, a far-from-equilibrium system, past a critical value where the stability of the personal system or its independence from disruptive forces could no longer be taken for granted.

According to chaos theory, in order for the fluctuation to gain sufficient force to move the system, it must function as a catalytic loop in a nonlinear reaction with a sufficient feedback action on itself, thus increasing its concentration within the system. The force of uncertainty can become
concentrated since uncertainty is a source of a nonlinear reaction. The existence of uncertainty in one area of illness often feeds back on itself and generates further uncertainty in other illness-related events. For example, uncertainty about how a treatment works to combat an illness creates uncertainties surrounding the reasons for symptoms that exist. Are the symptoms the result of the original illness or residuals of treatment? Also, in illness lacking a specific etiology, neutral elements of a person's life become imbued with the potential for causing illness exacerbation. Because uncertainty in illness can become involved in its own synthesis, according to chaos theory, it qualifies as a catalytic loop. As the concentration of the uncertainty expands, it can exceed the person's level of tolerance—the critical threshold causing the personal system to become unstable. The degree of disorder or entropy is calculated from the flux and the forces. Flux equates with the uncertainty, and forces are the significance of the life areas influenced by the uncertainty. The significance of these areas and their priority in one's life would account for the force with which uncertainty impacts on the person's life.

**Living with Continual Uncertainty**

If the uncertainty endures and cannot be eliminated, the length of time the flux of uncertainty exists is likely to enhance the sense of disorganization, promoting a high level of instability. Abiding uncertainty can dismantle the existing cognitive structures that give meaning to everyday events. According to Antonovsky (1987), for life to appear coherent, the events comprising one's life must be structured, ordered and predictable. When the stimuli associated with illness, treatment and recovery are vague, ill-defined, probabilistic, ambiguous and unpredictable, (i.e., uncertain) the sense of coherence is lost. This loss of meaning throws the person into a state of confusion and disorganization. The turbulence in the system demonstrative of chaos is proposed to be proportional to the uncertainty experienced by the patient.

The uncertainty in the illness situation is the source of a flux that shifts the person from an original position through a point of bifurcation toward a new state. Because of the predominant sense and display of disorder, the existence of a new state is not observable. At the time of disorder at the macroscopic level, when the uncertainty appears the highest, some early structuring of a new value system is occurring, imperceivable but existing at the microscopic level. Thus uncertainty may be a condition under which a person can make a transition during illness from one perspective of life toward a new, higher order, a more complex orientation toward life.

In all cases where this conceptualization is applied, one has to determine the necessary threshold of the uncertainty plus the essential time period for the flux to lead to a new perspective on life. It is likely this will differ across individuals and clinical situations. Yet the uncertainty will influence the development of this perspective in the person because chaos theory predicts the nature of the fluctuation influences the developing order. The new view of life will also develop from interaction with and exchange between the person and the external environment. Chaos theory states history, boundary conditions and external fields will influence the system's development of a new state of more complex order. Factors that influence the formation of the new orientation toward life in the ill person at the peak level of instability are prior life experience, physiological status, social resources and health care providers.

In the styling of the new perspective on life, a dynamic process occurs, with input from the social resources and health care providers. Patients attempt to integrate the experience of chronic uncertainty into their self-structure. The process is natural one unless it is blocked or prolonged. Horowitz (1979) offers the concept of "completion tendency," which seems to explain the integrative cognitive process. The patient cognitively reworks the evaluation of uncertainty from being aversive into being opportunistic by gradual approximation. The cognitive tasks of assimilation and accommodation continue until the cognitive models change so that reality and models achieve harmony. At completion, the experience in integrated into the view of the self and the view of the world (Green, Wilson & Lindy, 1985). This process is natural and is fueled by the attractor of the human need to cognitively structure life events.

**Outcome of Chronic Uncertainty—A New View**

The uncertainty that early in the illness was the source of fluctuation and disruption later in the illness becomes the foundation on which the new sense of order is constructed. The uncertainty is used by individuals as the basis for self-organization as they reformulate their view of life. The new state of order has a new world view involving probabilistic and conditional thinking. This new world view is not the positively oriented illusions generated from uncertainty as described in the original theory of uncertainty in illness.

To develop probabilistic thinking, the nature of uncertainty has to be accepted as the natural rhythm to life. The expectation of continual certainty and predictability is abandoned as a part of reality. Belief in a conditional world opens up the consideration of multiple possibilities since certainty is not absolute. When probabilistic thinking is used, events are seen as the result of various contingencies, and differentially effective responses are considered. Effectiveness of one's actions is appraised in terms of varying probabilities for success. There is a new ability to focus on multiple alternatives, choices and possibilities; to reevaluate what is important in life; to consider variations in personal investment; to appreciate the fragility and impermanence of life situations. The new view of life allows the evaluation of uncertainty to be changed from danger to opportunity.

In chaos theory, when the system self-organizes a new-level of complexity, the structure is termed "dissipative" because, to achieve a new level of stability, it exchanges disorder from the internal system to the environment. Within the illness situation a parallel activity occurs. Since the person with a new orientation toward life is a far-from-equilibrium system, the new view of life is fragile and it is maintained by continually expressing a negative appraisal of uncertainty into the environment in exchange for the view of uncertainty allows for multiple choices; thus uncertainty is an opportunity. The person functions to maintain this new view of life through the use of the two environmental forces of support resources and health care providers.

For this new orientation toward life to be maintained, both the social resources in a person's life and the health care providers must believe in a probabilistic paradigm rather than a mechanistic paradigm. If these persons share such a view, they can work with the patient to move with the...
uncertainty and to use it as a positive force in the patient's life. In the mechanistic paradigm, uncertainty is viewed as the enemy that must be eliminated. The assumption is all aspects of the illness can be linearly determined. In this paradigm, health care providers cannot join into a partnership with the patient to use the uncertainty as a force for evolution. In the probabilistic paradigm the uncertainty is viewed as natural: uncertainty is an inherent part of reality, and life is not assumed to be determinate with precision.

When family, friends and health care providers support a probabilistic view of life and of the illness, the acknowledgment of uncertainty removes a barrier to trust. The realization that uncertainty in an unescapably part of reality can motivate people to work at creating the trusting relationships and mutual support necessary in a world where no one can have a sure or final answer. Accepting uncertainty opens the door to consider multiple possibilities since nothing is certain or universal (Burszajen et al., 1981).

Within this conceptualization of the process of living with uncertainty in chronic illness, there are four situations in which the reevaluation of uncertainty can be blocked or prolonged, thus threatening the viability of the dissipative structure. The first situation occurs when the patient's supportive resources do not promote a probabilistic or conditional view of life. The second situation occurs when the patient is the major caretaker of significant others and delays their psychological response to their diagnosis and treatment. The delayed response to their experience blocks them from fully activating interactions with supportive others to facilitate restructuring the evaluation of uncertainty. The third situation occurs in patients who are isolated from interaction with social resources. These patients have less opportunity to obtain assistance in structuring the new view of life to dissipate the sense of uncertainty as aversive. The fourth blocking situation occurs when the patient's health care providers maintain a persistent search for predictability and certainty. When patients are treated by health care providers who fail to acknowledge the natural existence of uncertainty, the patient maintains the view uncertainty is an anomaly that must be removed.

As the process of integration and accommodation is blocked or prolonged, the behavior of the person will resemble that seen in posttraumatic stress disorders, a condition caused by exposure to catastrophic uncertainty and unpredictability. The evolution of uncertainty as being aversive continues to reverberate in the person, creating behaviors such as uncontrollable and emotionally distressing, intrusive thoughts or images connected with the aversive events, alternating with psychic numbing to shield the person from the trauma and a purposeful avoidance of situations, individuals, thoughts and feelings about the experience (Green, Grace & Lindy, 1988). This response is cyclic with clusters of symptoms fluctuating differentially over time (Green, Lindy & Grace, 1985; Green et al., 1985). Although this complex of behaviors will be demonstrated initially when uncertainty disrupts the person's life, the intensity and duration of the symptom complex will be prolonged and magnified in any of the four situations described above.

**Probabilistic Thinking**

Feedback from the health care providers promoting a probabilistic world view encourages the development of a new sense of order in the person. Current nursing practice involves activities that are consistent with this world view. Nursing activities with the chronically ill function currently to promote probabilistic thinking when nurses help the patient to consider multiple new ways to accomplish valued activities or consider alternatives in adjusting to the changing nature of the illness or foster the notion there are many factors influencing the patient's response to treatment. Nursing functions to facilitate the patient's evaluation of uncertainty and promote a probabilistic view of life.

When we encourage patients to consider alternatives and choices as possibilities, we are teaching them to alter their thinking from mechanistic to probabilistic. This new view of uncertainty as a natural phenomena is a new view of the world in which instability and fluctuation are natural and increase the person's range of possibilities. When nurses join with patients in the use of probabilistic thinking, the energy exchange between the patient and the external resources maintains the dissipative structure. When patients become adherents of probabilistic thinking, they seem to select health care professionals who will join them in this view of the world.

While this new view of uncertainty remains the theoretical level without empirical support, the view of uncertainty as leading to more possibilities and new patterns of contingencies is being considered not only in nursing but also in the current psychological literature on control (Strickland, 1989). The beneficial aspects of predictability and its related concept of control are being called into question (Piper & Langer, 1986). Newer theories of cognitive processing consider that to generate differentially effective responses, a certain amount of uncertainty may be essential (Piper & Langer, 1986). Creativity may require a letting go of conventional ways and creating new contingencies out of seemingly unrelated situations that are not completely predictable. Perhaps our emphasis on logical, linear thinking, which is a mechanistic world view, has inadvertently promoted inflexibility and a commitment to determinism in the chronically ill that precludes consideration of a conditional world view. The reformulation of the uncertainty theory has embraced this view.

**References**

