The Dynamical Perspective in Personality and Social Psychology

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Human experience reflects the interplay of multiple forces operating on various time scales to promote constantly evolving patterns of thought, emotion, and action. The complexity and dynamism of personal and social phenomena have long been recognized, but capturing these features of psychological process represents a serious challenge for traditional research methods. In this article, we introduce basic concepts and methods from the study of nonlinear dynamical systems, and we outline the relevance of these ideas and approaches for investigating phenomena at different levels of psychological reality. We suggest that the dynamical perspective is ideally suited to capture the emergence and maintenance of global properties in a psychological system, and for investigating the time-dependent relation between external influences and a system’s internally generated forces. Although fairly new to personality and social psychology, the dynamical perspective has been implemented with respect to a wide variety of phenomena, utilizing both empirical methods and computer simulations. This diversity of topics and methods is reflected in the articles comprising the special issue.

The subject matter of personality and social psychology is inherently dynamic. Actions are comprised of movement, judgments are grounded in the flow of thought, emotions rise and fall in intensity over time, social interactions unfold with a particular rhythm of words and gestures, and relationships are defined in terms of the evolution of roles and mutual sentiment. The dynamism inherent in personal and interpersonal experience has not been lost on our field. Indeed, the nature of human dynamism provided a focal point in the earliest attempts to characterize intrapersonal and interpersonal processes, as reflected in the seminal work of such pioneers as James (1890), Mead (1934), Cooley (1902), Lewin (1936), and Asch (1946). The focus on dynamics is apparent today in the coupling of the word dynamic with the various literatures that define the field. Thus, we speak of personality dynamics, dynamics of attitude change, interpersonal dynamics, and group dynamics, as if these topics each represented a particular manifestation of an underlying proclivity for evolution and change on the part of people.

In this basic sense, the theme of the special issue—the dynamical perspective in personality and social psychology—is hardly controversial. Recent years, however, have witnessed the ascendancy of a new way to conceptualize and investigate the nature of dynamism at different levels of psychological reality. Areas of inquiry as diverse as cognitive neuroscience (e.g., Port & van Gelder, 1995), developmental psychology (e.g., Fischer & Bidell, 1997; Levine & Fitzgerald, 1992; Thelen & Smith, 1994; van Geert, 1991), organizational behavior (Axelrod & Cohen, 2000; Guastello, 1995), and political sociology (e.g., Axelrod, 1984; Nowak & Vallacher, 2001; Weidlich, 1991) are being reframed in terms that allow rigorous and precise insight into basic dynamic processes that heretofore could only be inferred, and were often overlooked for want of appropriate tools. There are signs that this new approach to dynamics is emerging as a potentially integrative paradigm for personality and social psychology as well (cf. Carver & Scheier, 1999; Cervone & Mischel, 2002; Lewis, 1997; Nowak & Vallacher, 1998a; Read & Miller, 1998; Smith, 1996; Vallacher & Nowak, 1994a, 1997).
aim of the special issue is to highlight this new paradigm and illustrate its relevance to a broad spectrum of topics in personality and social psychology. Accordingly, we have assembled a group of researchers, each of whom has charted new directions for theory and research within the dynamical perspective.

To set the stage for their contributions to the special issue, we outline in broad form the approach to dynamics and complexity that has transformed the natural sciences in recent years. We suggest that this perspective resonates especially well with enduring issues in personality and social psychology, and thus serves as a valuable heuristic for research and a potential integrative vehicle for theory construction. The dynamical perspective should not be looked upon as simply a metaphor, however, but rather as a set of principles, methods, and tools that impose rigor and precision on topics that are often opaque when viewed through traditional lenses. The set of contributors we have assembled has been entrusted with the challenge to make this case.

Dynamism and Complexity in Personal and Interpersonal Experience

As noted earlier, the centrality of dynamics to human experience was recognized in early treatments of personal and interpersonal processes. James (1890) theorized about the dynamic nature of human thought and action, with special emphasis on the continuous and ever-changing stream of thought. Cooley (1902) emphasized people’s constant press for action, even in the absence of incentives and other external forces. Mead (1934) discussed people’s capacity for symbolic representation and the enormous range of interpretation to which this capacity gives rise. Lewin (1936) suggested that stability and variability in overt behavior reflect a persistent struggle to resolve conflicting motivational forces, including those within the person as well as those arising from outside influences. Psychodynamic theories (e.g., Freud, 1937), of course, shared this emphasis on conflict-induced dynamism, with particular importance assigned to motives and fears that are opaque to consciousness. Asch (1946) suggested that social judgment reflects the interplay of thoughts and feelings, with this interplay promoting the emergence of a unique Gestalt that is not reducible to the additive components of the individual cognitive elements themselves. Krech and Crutchfield (1948), in one of the earliest attempts to systematize social psychology in a textbook, framed interpersonal thought and behavior in Gestalt terms, with an explicit emphasis on people’s constant reconfiguration of their experience in response to conflicting fields of psychological forces.

These classic statements have found support in empirical research conducted in the intervening years, and they resonate well with lay intuitions regarding mental and behavioral processes. The sheer number and variety of factors identified as relevant to human experience guarantee that everything people think and do is constantly subject to change. Thoughts, feelings, and actions are influenced by a myriad of social stimuli that run the gamut from those that are momentary and trivial (e.g., a stranger’s glance) to those that are persistent and significant (e.g., criticism from a loved one). This influence is central to everyday social interaction, with each person responding to the real or imagined thoughts, feelings, and actions of the other person. Even in the absence of interpersonal contact, an individual’s mental state and predisposition for action can take on a variety of different forms as he or she reflects on past experiences or imagines those yet to take place. Patterns of thought, feeling, and action are generated as well by features of the larger social context, including the person’s relationship with various groups, his or her position in society as a whole, the nature of various social institutions, and the assortment of beliefs, values, and expectations that collectively define culture.

The potential for complexity and constant change is enhanced by several orders of magnitude when one considers the possible ways in which these factors can interact to influence an individual. The norms and beliefs in a particular social context, for instance, may run contrary to personal beliefs, societal norms, or standards of achievement. Which factor or blend of factors predominates, in turn, may depend upon yet other social influences and their interaction with prior experiences reaching back to childhood. Complex interactions of this type hold potential for generating diverse patterns of thought and behavior across individuals and for establishing different patterns within a given individual over time.

Even if we somehow managed to identify all relevant factors and specified how they interact to influence thought and behavior, we may still be at a loss to explain or predict a person’s beliefs, decisions, desires, or courses of action. Indeed, often the only explanation available for someone’s action centers on the person’s internal state—his or her goals, feelings, personality traits, motives, self-defined principles and values, sudden impulses, and so on. The human potential for internal causation not only confines upon people the capacity to resist external influences, but also an inclination to act in opposition to them. Unlike lower organisms, humans can disregard promises of reward, threats of punishment, social pressure from peers and authority figures, and other external inducements to action. In effect, then, the complex edifice of interacting causal forces permeating social life can collapse in the face of personal desires, values, and momentary whims.
The Relevance of Nonlinear Dynamical Systems

Because of its inherent dynamism and complexity, the subject matter of personality and social psychology represents a serious challenge for the methods and tools developed within the traditional natural science paradigm. Indeed, one could argue that the structure of human social experience is simply too intricate and multifaceted to admit to complete description, let alone precise prediction. Although this assessment has led some to question the goal of framing interpersonal phenomena in scientific terms (e.g., Gergen, 1994; Harré, 1987; Parker & Shotter, 1990), the nature of the field’s subject matter actually puts social psychology in a strong position to lead developments in science as we enter the 21st century. This is because the physical sciences have undergone a profound transformation since the 1980s, a transformation that makes these areas of inquiry more in tune with what personality and social psychologists have been talking about all along. The basis for this transformation was the realization that many phenomena in nature do not conform to certain long-standing assumptions regarding causality and reduction, but rather are more appropriately conceptualized as nonlinear dynamical systems (cf. Davies, 1988; Eckmann & Ruelle, 1985; Glass & Mackey, 1988; Gleick, 1987; Haken, 1978; Schuster, 1984; Thompson & Stewart, 1986; Weisbuch, 1992).

Broadly defined, a dynamical system is simply a set of elements that undergoes change over time by virtue of interactions among the elements. The primary task of dynamical systems theory is to describe the connections among a system’s elements and the changes in the system’s behavior that these connections promote. Prior to the advent of the mathematical theory of nonlinear dynamical systems, the physical sciences assumed that the relations among elements could be approximated as linear. A linear relation simply means that a change in one element (represented as a variable) is directly proportional to changes in another element (variable)—the greater the change in magnitude of one variable, the greater the resulting change in magnitude of the other variable. Expressed in causal terms, linearity means that the magnitude of the effect is proportional to the magnitude of the cause. In a linear system, moreover, the relations among variables are additive, so that a description of the system can be decomposed into separate influences, each of which can be analyzed independently. From this perspective, the complexity of a system’s behavior is a direct reflection of the number of interacting elements and the complexity of their mutual influences.

In a nonlinear system, the effects of changes in one variable are not reflected in a proportional manner in other variables. A variable may increase dramatically in magnitude, for example, with no corresponding change in magnitude of another variable until a threshold is reached, beyond which even miniscule changes in the first variable can promote very large changes in the second variable. The behavior of a nonlinear system, moreover, often cannot be decomposed into separate additive influences. Instead, the relations among variables typically depend on the values of other variables in the system and thus are interactive in nature. This means that one cannot ignore the effects of other variables when describing the relation between one’s variables of interest. These features of nonlinear systems provide a different perspective on the source of complexity in a system’s behavior. Even a system consisting of a few elements can exhibit behavior of enormous complexity when the interactions among the elements are nonlinear rather than linear (cf. Schuster, 1984).

Dynamical systems are characterized by global system-level properties. When the relations among system elements are nonlinear in nature, neither the system’s macrolevel properties nor the patterns of change in these properties are inherent in the system. Rather, these properties and their patterns of change emerge from rules specifying how the system’s elements interact. Emergence is reminiscent of pattern formation in Gestalt psychology (cf. Köhler, 1947) and is captured by the well-known phrase, “the whole is more than the sum of its parts.” In less evocative terms, the properties and patterns of behavior characterizing a system may arise in a fashion that cannot be predicted solely from knowledge of the individual elements in isolation. Despite the holistic (i.e., non-reductionistic) connotation of this feature of nonlinear systems, emergence is actually a well-specified process and can be understood in terms of a tendency toward self-organization among a system’s elements. The basic idea is that the interaction among system elements, where each element adjusts to other elements, can promote the emergence of highly coherent structures that provide coordination for the system elements (cf. Haken, 1978; Kelso, 1995). A system’s macrolevel properties derive from the internal workings of the system, in other words, without the need for a higher order control mechanism. This capacity for emergence is a defining feature of nonlinear systems in many areas of science, having been demonstrated in fields as diverse as hydrodynamics (Ruelle & Takens, 1971), meteorology (Lorenz, 1963), laser physics (Haken, 1982), and biology (e.g., Amit, 1989; Glass & Mackey, 1988).

The emergence of system-level properties by means of self-organization is apparent in a variety of otherwise distinct personal and interpersonal phenomena. Classic accounts of group and societal dynamics, for example, noted how group norms often develop through the spontaneous coordination of members’ impulses and actions, without the need for a higher-level authority to impose rules and standards (cf. Durkheim,
1938; Turner & Killian, 1957). In recent years, this observation has been verified in computer simulations and empirical research on social influence and interdependence (e.g., Axelrod, 1984; Messick & Liebrand, 1995; Nowak, Szamrej, & Latané, 1990; Nowak & Vallacher, 2001). Thus, simple social interactions over time tend to promote the emergence of public opinion, altruistic values, and other group level properties. At an intrapersonal level, meanwhile, the spontaneous self-organization of cognitive and affective elements into higher order structures has been revealed in experimental work on social judgment (e.g., Vallacher, Nowak, & Kaufman, 1994) and action identification (Vallacher, Nowak, Markus, & Strauss, 1998), and in computer simulations of self-reflection processes (Nowak, Vallacher, Tesser, & Borkowski, 2000). This work suggests that organized patterns of social thinking can emerge without the need for a higher-level cognitive mechanism or homunculus.

The specific trajectory of self-organization in a system reflects the system’s attempt to satisfy multiple constraints embedded in the initial state of the system. These constraints include the initial states of the elements, the nature of the interactions among elements, and the external influences on the system. The system’s evolution represents its attempt to reach a state that does the best possible job of satisfying such constraints. The evolution of a group norm, for example, depends on the initial dispositions and attitudes of each group member, the nature of the relationships among group members, and the exposure of group members to ideas and information from sources outside of the group. The norm that ultimately emerges represents the group’s attempt to find a balance among these potentially conflicting constraints. Constraint satisfaction also underlies the self-organization of specific thoughts and feelings into higher order cognitive structures within the individual. Thus, an individual’s attitudes and values presumably arise from the attempt to reconcile his or her preexisting judgments, diverse pieces of old and new information, and conflicting social pressures and expectations.

Dynamical systems are rarely self-contained, but rather are open to influence from external factors by virtue of being embedded in a larger context. Thus, a person’s attitude may change in response to persuasive communication, a group may reverse a decision based on new information, and a society can undergo transformations due to changing international conditions. The result of such influences, however, is dependent on the internal state of the system in question. This is because external factors do not cause changes directly in an otherwise passive system, but rather exert their influence by modifying the course of whatever internally generated dynamics are operative for the person, group, or society. Lacking insight into the ongoing processes within a person or social group, it is difficult to know what effect a given external influence is likely to have. When external influences are present, the system’s macrolevel properties may change in a manner that is non-proportional to the magnitude of the influences. Sometimes an external factor produces only resistance, with little or no change in the ongoing processes of the person or group. At other times, the person or group may show an exaggerated response to a lesser value of the same external factor. At yet other times, an external influence may initiate a process that unfolds according to its own pattern of changes, the effects of which may not be apparent for days, minutes, or years, depending on the phenomenon in question.

Research strategies that reduce dynamics to a single pass and focus on a stable outcome are clearly inadequate to capture these propensities. Rather than focusing on a snapshot of a specific phenomenon, insight is often better served by exploring how the system in question evolves in time. A system may eventually stabilize at a given value, but knowing this value may be less informative than knowing the sequence of states through which the system evolved in route to this state. Two people may ultimately be swayed by a persuasive message, for example, but they may have experienced qualitatively different routes to their shared stance, with one person incrementally adjusting his or her initial position and the other person demonstrating sizable swings in opinion before reaching a new attitude equilibrium. The evolution of each person’s attitude may provide insight into the nature of his or her underlying cognitive structure and personality traits that would not be forthcoming from knowing only the ultimate effect of the persuasive appeal.

Beyond that, some systems may fail to reach a single stable state that satisfies all constraints, displaying instead a sustained pattern of changes among different states. For phenomena characterized by such dynamic as opposed to static equilibrium tendencies, the attempt to identify a single state as most representative may provide an impoverished and a potentially misleading depiction. There may be greater information value, for example, in knowing the temporal pattern of someone’s mood variability than in knowing the central tendency of his or her mood state—a state he or she might never experience. An interpersonal level, identifying the temporal pattern of a couple’s mutual affect may provide greater insight into the nature of the relationship than simply collapsing over time to compute the mean level of affect in the relationship. A husband and wife may oscillate between periods of deep passion and bitter resentment, for example, and never experience the central tendency of these opposing sentiments.

The approach of nonlinear dynamical systems is ideally suited to investigate internally generated dynamics, self-organization, the emergence of global properties from the interaction of basic elements, and
the time-dependent relation between external influences and a system’s intrinsic dynamics. And because this approach is defined in formal terms, it holds potential for identifying invariant properties of dynamics that transcend topical boundaries and levels of analysis. Research on nonlinear dynamical systems has established, in fact, that the dynamics of highly diverse systems in areas as distinct as physics, chemistry, biology, and economics conform to a handful of basic patterns or attractors. Rather than simply evolving toward a stable equilibrium (i.e., fixed-point attractor), systems can display self-sustaining temporal patterns (e.g., periodic, quasi-periodic, or chaotic attractors) as a result of repeated iterations of the mutual influences among variables internal to the system.

To identify and investigate patterns of intrinsic dynamics, mathematicians and scientists in various fields have developed a variety of methods and tools, many of which are readily adaptable to basic concerns in personality and social psychology. This suggests the potential for developing general laws of psychological dynamics that apply to all levels of social reality, from the flow of individual thoughts to societal transformations. Beyond providing coherence to an admittedly fragmented discipline (cf. Kenrick, 2001; Vallacher & Nowak, 1994b), the discovery of such laws in social psychology may foster new levels of integration with other areas of psychology that have already embraced the dynamical perspective (e.g., developmental and cognitive psychology) and with other areas of science as well.

Dynamical Research: From Meta-Theory to Implementation

No one would argue with the suggestion that human social experience is complex and dynamic, nor would most observers deny the potential relevance and utility of nonlinear dynamical systems to personal and interpersonal phenomena. Indeed, the past decade has witnessed the emergence of considerable interest and curiosity regarding the promise of the dynamical approach (cf. Barton, 1994; Carver & Scheier, 1999; Eiser, 1994; Goldstein, 1996; Guastello, 1995; Holland, 1995; Kenrick, 2001; Nowak & Vallacher, 1998a; Vallacher & Nowak, 1994a, 1997). What is less clear to many researchers, though, is whether it is necessary—or possible, for that matter—to implement this approach in their own research agendas. Many of the methods and tools developed to investigate the dynamic properties of complex systems are foreign to the experience of personality and social psychologists, and it isn’t self-evident that going to the trouble to adapt such tools will have a ready pay-off in advancing theoretical understanding or real-world application.

This concern has diminished somewhat in recent years with the advent of several research programs that have established a track record in implementing dynamical concepts and methods. Some of these programs have used experimental methods to track the temporal trajectories of diverse processes, including social interaction (e.g., Beek & Hopkins, 1992; Buder, 1991; Newton, 1994), personality expression (e.g., Brown & Moskowitz, 1998; Mischel & Shoda, 1995), mood (e.g., Schuldberg & Gottlieb, 2002), group dynamics (e.g., Arrow, 1997; Arrow, McGrath, & Berdahl, 2000; Losada & Markovitch, 1990), close relationships (e.g., Gottman, Murray, Swanson, & Tyson, in press), attitude change (Kaplowitz & Fink, 1992; Latané & Nowak, 1994), conformity (Tesser & Achee, 1994), social judgment (e.g., Vallacher et al., 1994), and self-evaluation (e.g., Vallacher & Nowak, 2000). In a few instances, the experimental methods have been supplemented by analytical tools designed to identify the formal properties of the observed dynamics. The periodic flow of social interaction has been shown to have a fractal (i.e., self-similar) structure (Newton, 1994), for example, and the intrinsic dynamics of social judgment have been shown to reflect the operation of a low-dimensional cognitive-affective system (Vallacher et al., 1994).

For the most part, however, computer simulations provide the tool of choice in investigating personal and interpersonal dynamics. To date, the most frequently employed simulation platforms in this work are cellular automata and neural networks (cf. Liebrand, Nowak, & Hegselman, 1998; Nowak & Vallacher, 1998b; Read & Miller, 1998). These approaches have proven especially useful in modeling the emergence of global properties from the interactions of individual elements. Two levels of social reality are most often investigated in this manner. At the level of intrapersonal processes, elements typically correspond to components of the cognitive system (e.g., specific thoughts and pieces of information), and the global level refers to such macroscopic properties of cognition as decisions, judgments, and self-concepts. Different manifestations of the tendency toward coherence in social judgment (e.g., dissonance reduction, causal reasoning, impression formation, stereotype formation and change), for example, have been analyzed as constraint satisfaction processes within a connectionist or neural network framework (e.g., Kunda & Thagard, 1996; Read & Montoya, 1999; Read, Vanman, & Miller, 1997; Shultz & Lepper, 1996; Smith, 1996). The emergence of global properties of self-concept (e.g., self-esteem, differentiation) from the self-organization of specific elements of self-relevant information, meanwhile, has been modeled within a cellular automata framework (Nowak et al., 2000). At a higher level of social reality, elements correspond to individuals and the system-level properties refer to various group-level
patterns in by to computer simulations have in theory can self-concept through one’s of development in the sciences Decades of real may very necessary social example, first sight at unreasonable to expect reversal evolution of shared ple, simple global sary for the system-level observe and individual elements the macrolevels of social interpersonal relationships for the micro- and necessary to produce the system-level phenomena. The social dilemma is a frequent subject of novels and movies, in reality many interactions and prolonged contact may be necessary for a romantic attraction to develop. The very nature of computer simulations is ideal for studying the effects of multiple iterations of a given process. Decades of real time, and thousands of real interactions, may be compressed into seconds of computer time, revealing delayed consequences that simply cannot be observed in real time. It is not surprising, then, that computer simulations have proven to be central to the development of dynamical models, both in the natural sciences and in the recent applications to personal and social psychological phenomena.

The use of computers should not be viewed as an alternative to experimental research. To the contrary, these two approaches are complementary, providing cross-validation for one another and working together in theory construction and testing. Computers, first of all, provide a tool for the visualization of both experimental and simulation data. Through computer visualization, an investigator can discover patterns that are predicted by theory or that exist in reality. Thus, one can literally see the emergence of temporal and spatial patterns in a social psychological process, whether the spread of public opinion through social influence (Nowak et al., 1990) or the progressive differentiation of self-concept through socially provided feedback on one’s qualities (Nowak et al., 2000). Beyond that, the comparison of patterns and outcomes identified in experimental data and the patterns and outcomes produced by computer simulation of a model provides a new means of verifying a theory. The results of an experiment or a set of experiments can be implemented in a computer program to assess feasibility and long-term consequences of the process in question. The results of a computer simulation, in turn, may suggest a particular configuration of influences that can be validated in subsequent experimental work. Through repeated iterations of the reciprocal feedback between simulation and experiment, one is in a position to gain greater precision in theoretical understanding.

We wish to emphasize that the dynamical approach does not represent a challenge to well-established intuitions regarding human experience. To the contrary, the application of dynamical concepts and methods is likely to enhance rather than diminish the uniqueness of personality and social psychology. Unlike the application of traditional natural science assumptions, the dynamical approach provides full expression to the complexity and malleability of human experience, enabling researchers to be more explicit than ever about the issues that defined our field in its infancy. Only recently have the physical sciences matured to the point that they can appreciate what personality and social psychologists have known all along. In their attempt to capture the complex and dynamic nature of basic physical processes, scientists in many disciplines have developed a wide variety of algorithms, formal tools, and new empirical approaches. By adapting these methods to the special nature of human experience, the field of personality and social psychology is in a position to impose precision and rigor on the early insights that defined this area of inquiry.

Overview of Articles in the Special Issue

The dynamical perspective is in its infancy and thus still largely unfamiliar to the majority of personality and social psychologists. Despite the emerging lines of research described previously, then, it may not be clear how the various methods and tools we have described can be implemented to shed new light on the wide range of topics that define the field. By bringing together prominent researchers who are on the cutting edge of this approach, we hope to bridge the gap between metaphor and practice, to translate promise into reality. Each of the following articles outlines a unique approach and does so in the context of an important intrapersonal or interpersonal phenomenon. To highlight the range of phenomena addressed, we have sorted these articles into a tripartite structure that should prove familiar to everyone in our field: Cognitive and Affective Dynamics, Interpersonal and Group Dynamics, and Personality Dynamics. We hope that
the specific configuration of basic strategies and topics represented in this set of articles will promote the emergence of a deeper appreciation of what the dynamical perspective has to offer the field.

Cognitive and Affective Dynamics

Thagard and Nerb (this issue) examine how parallel constraint satisfaction processes operating in a dynamic neural network can capture important aspects of emotional dynamics. One model, HOTCO, shows how an individual’s emotions may shift as a result of constraint satisfaction processes operating on a set of both cognitive and evaluative components. A second model, ITERA, integrates work from appraisal theories of emotion within a constraint satisfaction model and demonstrates how appraisals can be integrated with other types of information to generate an emotional response.

Simon and Holyoak (this issue) argue that early work on consistency theories, although quite promising, failed to provide an account of how attitudes are formed and decisions are made. However, they suggest that recent connectionist models of constraint satisfaction provide a general and testable account of the role that consistency principles play in decision making and attitude formation. They then discuss their recent body of work on complex legal decision making that demonstrates how constraint-satisfaction mechanisms can transform initially ambiguous legal evidence into coherent decisions.

Queller (this issue) presents a recurrent distributed network model that simulates two seemingly distinct models of stereotype change—book keeping and subtyping—that have been presented as reflecting different cognitive processes. She shows that the apparent difference between book keeping and subtyping is due to differences in the degree of covariation among features induced by the different stimulus sets used. Her model thus explains, and thereby integrates, these two types of stereotype change.

Carver and Scheier (this issue) are well known for their control systems theory of self-regulation, which portrays an individual as guiding his or her behavior by monitoring the discrepancy between a current state and a goal state. They note that this “top down” view seems to conflict with the more “bottom up” view of dynamical systems models, in which attractors and repellors for a system develop by means of self-organization processes. However, they argue that these principles sometimes reflect different ways of looking at the same issue, and sometimes represent complementary principles that address different levels of the more general process.

Personality Dynamics

Read and Miller (this issue), like Shoda et al. (this issue), present a neural network model of personality. Whereas Shoda et al. focus on the abstract characteristics of their model, such as its dynamics and the number and types of attractors, Read and Miller present a model that captures important aspects of what is currently known about personality structure. Relying heavily on work in temperament, personality structure, and the neuroscience of motivation and emotion, they construct a neural network model that attempts to simulate some of the major distinctions in personality, such as extroversion, neuroticism, and conscientiousness.
Vallacher, Nowak, Froehlich, and Rockloff (this issue) investigate the implications of conceptualizing the self-concept as a self-organizing dynamical system. They suggest that self-evaluative thought evolves toward regions of maximal evaluative coherence in self-structure, and that the valence of these fixed-point attractors dictates a person’s level of self-esteem. They present preliminary research on the flow of self-evaluative thought showing that whereas self-esteem is related to overall self-evaluation, self-concept coherence determines the dynamic properties of such thinking (e.g., movement between different self-evaluative states).

Johnson and Nowak (this issue) examine dynamical patterns in the emotions and symptomatology of individuals with bipolar depression. To do so, they use a newly developed technique that identifies the number and nature of attractors in time series data. In applying this method to the monthly self-reports of their participants, they identify several distinct types of attractors, each associated with a set of outcome criteria. They show that the lack of stable attractors is especially dysfunctional in that it predicts frequency of hospitalization and suicidality.

References


The Dynamical Perspective


