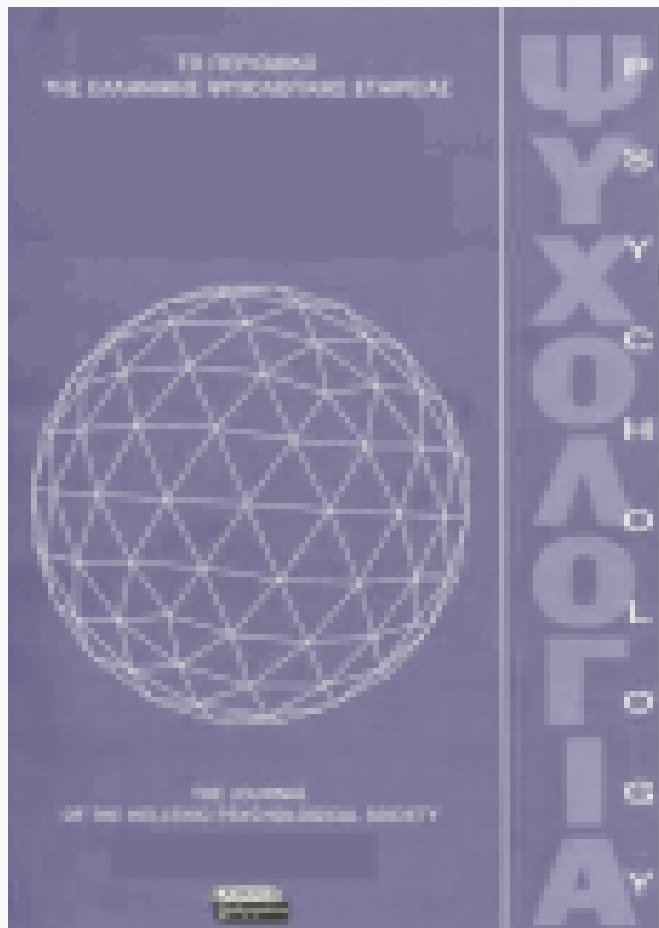


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Social Cognitive Theory: An Agentic Perspective

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ABSTRACT

The capacity to exercise control over the nature and quality of one's life is the essence of humanness. Human agency is characterized by a number of core features that operate through phenomenal and functional consciousness. These include the temporal extension of agency through intentionality and forethought, self-regulation by self-reactive influence, and self-reflectiveness about one's capabilities, quality of functioning, and the meaning and purpose of one's life pursuits. Personal agency operates within a broad network of sociostructural influences. In these agentic transactions, people are producers as well as products of social systems. Social cognitive theory distinguishes among three modes of agency: direct personal agency, proxy agency that relies on others to act on one's behalf to secure desired outcomes, and collective agency exercised through socially coordinative and interdependent effort. Growing transnational embeddedness and interdependence are placing a premium on collective efficacy to exercise control over personal destinies and national life.

Key words: Biosocial coevolution, Collective efficacy, Emergent properties, Human agency, Self-efficacy.

Introduction

To be an agent is to intentionally make things happen by one's actions. Agency embodies the endowments, belief systems, self-regulatory capabilities and distributed structures and functions through which personal influence exercised, rather than residing as a discrete entity in a particular place. The core features of agency enable people to play a part in their self development, adaptation, and self-renewal with changing times. Before presenting the agentic perspective of social cognitive theory, the paradigm shifts that the field of psychology has undergone in its short history warrant a brief discussion. In these

theoretical transformations, the core metaphors have changed but for the most part, the theories grant humans little, if any, agentic capabilities.

Paradigm shifts in psychological theorizing

Much of the early psychological theorizing was founded on behavioristic principles that embraced an input-output model linked by an internal conduit that makes behavior possible but exerts no influence of its own on behavior. In this view, human behavior was shaped and controlled automatically and mechanically by environmental stimuli. This line of theorizing was eventually put

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out of vogue by the advent of the computer, which likened the mind to a biological calculator. This model filled the internal conduit with a lot of representational and computational operations created by smart and inventive thinkers.

If computers can perform cognitive operations that solve problems, regulative thought could no longer be denied to humans. The input-output model was supplanted by an input-linear throughput-output model. The mind as digital computer became the conceptual model for the times. Although the mindless organism became a more cognitive one, it was still devoid of consciousness and agentic capabilities. For decades, the reigning computer metaphor of human functioning was a linear computational system in which information is fed through a central processor that cranks out solutions according to preordained rules. The architecture of the linear computer at the time dictated the conceptual model of human functioning.

The linear model was, in turn, supplanted by more dynamically organized computational models that perform multiple operations simultaneously and interactively to mimic better how the human brain works. In this model, environmental input activates a multifaceted dynamic throughput that produces the output. These dynamic models include multilevel neural networks with intentional functions lodged in a subpersonal executive network operating without any consciousness via lower subsystems. Sensory organs deliver up information to a neural network acting as the mental machinery that does the construing, planning, motivating, and regulating nonconsciously. Harré (1983) notes in his analysis of computationalism that it is not people but their componentized subpersonal parts that are orchestrating the courses of action. The personal level involves phenomenal consciousness and the purposive use of information and self-regulative means to make desired things happen.

Consciousness is the very substance of mental life that not only makes life personally manageable but worth living. A functional consciousness

involves purposive accessing and deliberative processing of information for selecting, constructing, regulating, and evaluating courses of action. This is achieved through intentional mobilization and productive use of semantic and pragmatic representations of activities, goals, and other future events. In his discerning book on experienced cognition, Carlson (1997) underscores the central role that consciousness plays in the cognitive regulation of action and the flow of mental events. There have been some attempts to reduce consciousness to an epiphenomenal by-product of activities at the subpersonal level, to an executive subsystem in the information processing machinery, or to an attentional aspect of information processing. Like the legendary ponderous elephant that goes unnoticed, in these subpersonal accounts of consciousness there is no experiencing person conceiving of ends and acting purposefully to attain them. However, these reductive accounts remain conceptually problematic because they omit prime features of humanness such as subjectivity, deliberative self-guidance, and reflective self-reactiveness. For reasons to be given shortly, consciousness cannot be reduced to a nonfunctional by-product of the output of a mental process realized mechanically at nonconscious lower levels. Why would an epiphenomenal consciousness that can do nothing evolve and endure as a reigning psychic environment in people's lives? Without a phenomenal and functional consciousness people are essentially higher-level automatons undergoing actions devoid of any subjectivity or conscious control. Nor do such beings possess a meaningful phenomenal life or a continuing self-identity derived from how they live their life and reflect upon it.

Green & Vervaeke (1996) observed that originally many connectionists and computationalists regarded their conceptual models as approximations of cognitive activities. More recently, however, some have become eliminative materialists, likening cognitive factors to the phlogiston of yesteryear. In this view, people do

not act on beliefs, goals, aspirations, and expectations. Rather, activation of their network structure at a subpersonal level makes them do things. In a critique of eliminativism, Greenwood (1992) notes that cognitions are contentful psychological factors whose meaning does not depend on the explanatory propositions in which they figure. Phlogiston neither had any evidential basis nor explanatory or predictive value. In contrast, cognitive factors do quite well in predicting human behavior and guiding effective interventions. To make their way successfully through a complex world full of challenges and hazards, people have to make good judgments about their capabilities, anticipate the probable effects of different events and courses of action, size up sociostructural opportunities and constraints, and regulate their behavior accordingly. These belief systems are a working model of the world that enables people to achieve desired outcomes and avoid untoward ones. Forethoughtful, generative, and reflective capabilities are, therefore, vital for survival and human progress. Agentic factors that are explanatory, predictive, and of demonstrated functional value may be translatable and modeled in another theoretical language but not eliminatable (Rottschaefer, 1985, 1991).

Physicalistic theory of human agency

As has already been noted, people are not just onlooking hosts of internal mechanisms orchestrated by environmental events. They are agents of experiences rather than simply undergoers of experiences. The sensory, motor, and cerebral systems are tools people use to accomplish the tasks and goals that give meaning, direction, and satisfaction to their lives (Bandura, 1997; Harré & Gillet, 1994).

Research on brain development underscores the influential role that agentic action plays in shaping the neuronal and functional structure of the brain (Diamond, 1988; Kolb & Whishaw, 1998). It

is not just exposure to stimulation, but agentic action to exploring, manipulating, and influencing the environment that counts. By regulating their motivation and activities, people produce the experiences that form the functional neurobiological substrate of symbolic, social, psychomotor, and other skills. The nature of these experiences is, of course, heavily dependent on the types of social and physical environments people select and construct. An agentic perspective fosters lines of research that provide new insights into the social construction of the functional structure of the human brain (Eisenberg, 1995). This is a realm of inquiry in which psychology can make fundamental unique contributions to the biopsychosocial understanding of human development, adaptation, and change.

Social cognitive theory subscribes to a model of emergent interactive agency (Bandura, 1986, 1999a). Thoughts are not disembodied, immaterial entities that exist apart from neural events. Cognitive processes are emergent brain activities that exert determinative influence. Emergent properties differ qualitatively from their constituent elements and therefore are not reducible to them. To use Bunge's (1977) analogy, the unique emergent properties of water, such as fluidity, viscosity, and transparency are not simply the aggregate properties of its microcomponents of oxygen and hydrogen. Through their interactive effects they are transformed into new phenomena.

One must distinguish between the physical basis of thought and its deliberative construction and functional use. The human mind is generative, creative, proactive, and reflective, not just reactive. The dignified burial of the dualistic Descartes forces us to address the formidable explanatory challenge for a physicalistic theory of human agency and a nondualistic cognitivism. How do people operate as thinkers of the thoughts that exert determinative influence on their actions? What are the functional circuitries of forethought, planful proaction, aspiration, self-appraisal, and self-reflection? Even more important, how are they intentionally recruited?

Cognitive agents regulate their actions by cognitive downward causation as well as undergo upward activation by sensory stimulation (Sperry, 1993). People can designedly conceive unique events and different novel courses of action and choose to execute one of them. Under the indefinite prompt to concoct something new, for example, one can deliberately construct a whimsically novel scenario of a graceful hippopotamus attired in a chartreuse tuxedo hang gliding over lunar craters while singing the mad scene from the opera *Lucia di Lammermoor*. Intentionality and agency raise the fundamental question of how people bring about activities over which they command personal control that activate the subpersonal neuro-physiological events for realizing particular intentions and aspirations. Thus, in acting on the well-grounded belief that exercise enhances health, individuals get themselves to perform physical activities that produce health promotive biological events without observing or knowing how the activated events work at the subpersonal level. The health outcome is the product of both agent causality and event causality, operating at different phases of the sequence.

Our psychological discipline is proceeding down two major divergent routes. One line of theorizing seeks to clarify the basic mechanisms governing human functioning. This line of inquiry centers heavily on microanalyses of the inner workings of the mind in processing, representing, retrieving, and using the coded information to manage various task demands, and locating where the brain activity for these events occurs. These cognitive processes are generally studied disembodied from interpersonal life, purposeful pursuits, and self-reflectiveness. People are sentient, purposive beings. Faced with prescribed task demands, they act mindfully to make desired things happen rather than simply undergo happenings to which situational forces activate their subpersonal structures that generate solutions. In experimental situations, participants try to figure out what is wanted of them; they construct hypotheses and reflectively test their adequacy by evaluating the results of their

actions; they set personal goals and otherwise motivate themselves to perform in ways that please or impress others or bring self-satisfaction; when they run into trouble they engage to self-enabling or self-debilitating self-talk; if they construe their failures as presenting surmountable challenges they redouble their efforts, but they drive themselves to despondency if they read their failures as indicants of personal deficiencies; if they believe they are being exploited, coerced, disrespected, or manipulated, they respond apathetically, oppositionally, or hostilely. These motivational and other self-regulative factors that govern the manner and level of personal engagement in prescribed activities are simply taken for granted in cognitive science rather than included in causal structures (Carlson, 1997).

The second line of theorizing centers on the macroanalytic workings of socially situated factors in human development, adaptation, and change. Within this theoretical framework, human functioning is analyzed as socially interdependent, richly contextualized, and conditionally orchestrated within the dynamics of various societal subsystems and their complex interplay. The mechanisms linking sociostructural factors to action in this macroanalytic approach are left largely unexplained, however. A comprehensive theory must merge the analytic dualism by integrating personal and social foci of causation within a unified causal structure.

In the paths of influence, sociostructural influences operate through psychological mechanisms to produce behavioral effects. We shall return later to this issue and to the bidirectionality of influence between social structure and personal agency.

Core features of human agency

The core features of personal agency address the issue of what it means to be human. The main agentic features are discussed in the sections that follow.

Intentionality

Agency refers to acts done intentionally. For example, a person who smashed a vase in an antique shop upon being tripped by another shopper would not be considered the agent of the event. Human transactions, of course, involve situational inducements, but they do not operate as determinate forces. Individuals can choose to behave accommodatively or, through the exercise of self-influence, too behave otherwise. An intention is a representation of a future course of action to be performed. It is not simply an expectation or prediction of future actions but a proactive commitment to bringing them about. Intentions and actions are different aspects of a functional relation separated in time. It is, therefore, meaningful to speak of intentions grounded in self-motivators affecting the likelihood of actions at a future point in time.

Planning agency can be used to produce different outcomes. Outcomes are not the characteristics of agentive acts; they are the consequences of them. As Davidson (1971) explains, actions intended to serve a certain purpose can cause quite different things to happen. He cites the example of the melancholic Hamlet, who intentionally stabbed the man behind a tapestry believing it to be the king, only to discover, much to his honor, that he had killed Polonius. The killing of the hidden person was intentional, but the wrong victim was done in. Some of the actions performed in the belief that they will bring desired outcomes actually produce outcomes that were neither intended nor wanted. For example, it is not uncommon for individuals to contribute to their own misery through intentional transgressive acts spawned by gross miscalculation of consequences. Some social policies and practices originally designed with well-meaning intent turn out bad because their harmful effects were unforeseen. In short, the power to originate actions for given purposes is the key feature of personal agency. Whether the exercise of that agency has beneficial or

detrimental effects, or produces unintended consequences, is another matter.

Intentions center on plans of action. Future-directed plans are rarely specified in full detail at the outset. It would require omniscience to anticipate every situational detail. Moreover, turning visualized futurities into reality requires proximal or present-directed intentions that guide and keep one moving ahead (Bandura, 1991b). In the functionalist approach to intentional agency enunciated by Bratman (1999), initial partial intentions are filled in and adjusted, revised, refined or even reconsidered in the face of new information during execution of an intention. We shall see shortly, however, that realization of forward looking plans requires more than an intentional state because it is not causally sufficient by itself. Other self-regulatory aspects of agency enter into the successful implementation of intentions. To add a further functional dimension to intention, most human pursuits involve other participating agents. Such joint activities require commitment to a shared intention and coordination of interdependent plans of action. The challenge in collaborative activities is to meld diverse self-interests in the service of common goals and intentions collectively pursued in concert.

Forethought

The temporal extension of agency goes beyond forward-directed planning. The future time perspective manifests itself in many different ways. People set goals for themselves, anticipate the likely consequences of prospective actions, and select and create courses of action likely to produce desired outcomes and avoid detrimental ones (Bandura, 1991b; Feather, 1982; Locke & Latham, 1990). Through the exercise of forethought, people motivate themselves and guide their actions in anticipation of future events. When projected over a long time course on matters of value, a forethoughtful perspective provides direction, coherence, and meaning to one's life. As people progress in their life course they continue to plan ahead, reorder their priorities, and structure their lives accordingly.

Future events cannot, of course, be causes of current motivation and action because they have no actual existence. However, by being represented cognitively in the present, foreseeable future events are converted into current motivators and regulators of behavior. In this form of anticipatory self-guidance, behavior is motivated and directed by projected goals and anticipated outcomes rather than being pulled by an unrealized future state.

People construct outcome expectations from observed conditional relations between environmental events in the world around them, and the outcomes given actions produce (Bandura, 1986). The ability to bring anticipated outcomes to bear on current activities promotes foresightful behavior. It enables people to transcend the dictates of their immediate environment and to shape and regulate the present to fit a desired future. In regulating their behavior by outcome expectations, people adopt courses of action that are likely to produce positive outcomes and generally discard those that bring unrewarding or punishing outcomes. However, anticipated material and social outcomes are not the only kind of incentives that influence human behavior, as a crude functionalism would suggest. If actions were performed only on behalf of anticipated external rewards and punishments, people would behave like weather vanes, constantly shifting direction to conform to whatever influence happened to impinge upon them at the moment. In actuality, people display considerable self-direction in the face of competing influences. After they adopt personal standards, people regulate their behavior by self-evaluative outcomes, which may augment or override the influence of external outcomes.

Self-reactiveness

An agent has to be not only a planner and forethinker, but a motivator and self-regulator as well. Having adopted an intention and an action plan, one cannot simply sit back and wait for the appropriate performances to appear. Agency thus involves not only the deliberative ability to make

choices and action plans, but the ability to give shape to appropriate courses of action and to motivate and regulate their execution. This multifaceted self-directedness operates through self-regulatory processes that link thought to action. The selfregulation of motivation, affect, and action is governed by a set of self-referent subfunctions. These include self-monitoring, performance self-guidance via personal standards, and corrective self-reactions (Bandura, 1986, 1991b).

Monitoring one's pattern of behavior and the cognitive and environmental conditions under which it occurs is the first step toward doing something to affect it. Actions give use to self-reactive influence through performance comparison with personal goals and standards. Goals, rooted in a value system and a sense of personal identity, invest activities with meaning and purpose. Goals motivate by enlisting self-evaluative engagement to activities rather than directly. By making self-evaluation conditional on matching personal standards, people give direction to their pursuits and create self-incentives to sustain their efforts for goal attainment. They do things that give them self-satisfaction and a sense of pride and self-worth, and refrain from behaving in ways that give use to self-dissatisfaction, self-devaluation, and self-censure.

Goals do not automatically activate the self-influences that govern motivation and action. Evaluative self-engagement through goal setting is affected by the characteristics of goals, namely, their specificity, level of challenge and temporal proximity. General goals are not indefinite and noncommitting to serve as guides and incentives. Strong interest and engrossment in activities is sparked by challenging goals. The self-regulative effectiveness of goals depends greatly on how far into the future they are projected. Proximal subgoals mobilize self-influences and direct what one does in the here and now. Distal goals alone set the general course of pursuits but are too far removed in time to provide effective incentives

and guides for present action, given inviting competing activities at hand. Progress toward valued futures is best achieved by hierarchically structured goal systems combining distal aspirations with proximal self-guidance. Goals embodying self-engaging properties serve as powerful motivators of action (Bandura, 1991b; Locke & Latham, 1990).

Moral agency forms an important part of self-directedness. Psychological theories of morality focus heavily on moral reasoning to the neglect of moral conduct. A complete theory of moral agency must link moral knowledge and reasoning to moral conduct. This requires an agentic theory of morality rather than actions confined mainly to cognitions about morality. Moral reasoning is translated into actions through self-regulatory mechanisms, which include moral judgment of the rightness or wrongness of conduct evaluated against personal standards and situational circumstances, and self-sanctions by which moral agency is exercised (Bandura, 1991a).

In competency development and aspirational pursuits, the personal standards of merit are progressively raised as knowledge and competencies are expanded and challenges are met. In social and moral conduct, the self-regulatory standards are more stable. People do not change from week to week what they regard as right or wrong or good or bad. After people adopt a standard of morality, their negative self-sanctions for actions that violate their personal standards, and their positive self-sanctions for conduct faithful to their moral standards serve as the regulatory influences (Bandura, 1991b). The capacity for self-sanctions gives meaning to moral agency. The anticipatory evaluative self-reactions provide the motivational as well as the cognitive regulators of moral conduct. Self-sanctions keep conduct in line with personal standards. Individuals with a strong communal ethic will act to further the welfare of others even at costs to their self-interest. In the face of situational pressures to behave inhumanely, people can choose to behave otherwise by exerting

counteracting self-influence. It is not uncommon for individuals to invest their self-worth so strongly in certain convictions that they will submit to harsh and punitive treatment rather than cede to what they regard as unjust or immoral.

The exercise of moral agency has dual aspects—inhibitive and proactive (Bandura, 1999b). The inhibitive form is manifested in the power to refrain from behaving inhumanely. The proactive form of morality is expressed in the power to behave humanely.

Moral standards do not function as fixed intrnal regulators of conduct. however. Self-regulatory mechanisms do not operate unless they are enlisted in given activities. There are many psychosocial maneuvers by which moral self-reactions can be selectively disengaged from inhumane conduct (Bandura, 1991b). Several of these mechanisms of moral disengagement center on the cognitive reconstrual of the conduct itself. This is achieved by making harmful conduct personally and socially acceptable by portraying it as serving socially worthy or moral purposes, masking it in sanitizing euphemistic language, and creating exonerating comparison with worse inhumanities. Other mechanisms reduce the sense of personal agency for harmful conduct through diffusion and displacement of responsibility. Moral self-sanctions are also weakened or disengaged at the outcome locus of the control process by ignoring, minimizing, or disputing the injurious effects of one's conduct. The final set of practices disengage restraining self-sanctions by dehumanizing the victims, attributing bestial qualities to them, and blaming them for bringing the suffering on themselves. High moral disengagers experience low guilt over harmful conduct, are less prosocial, and are more prone to vengeful rumination (Bandura et al., 1996b). Through selective disengagement of moral agency, people who otherwise behave righteously and considerably perpetrate transgressions and inhumanities in other spheres of their lives (Bandura, 1999b; Zimbardo, 1995).

Self-reflectiveness

People are not only agents of action but self-examiners of their own functioning. The metacognitive capability to reflect upon oneself and the adequacy of one's thoughts and actions is another distinctly core human feature of agency. Through reflective self-consciousness, people evaluate their motivation, values, and the meaning of their life pursuits. It is at this higher level of self-reflectiveness that individuals address conflicts in motivational inducements and choose to act in favor of one over another. Verification of the soundness of one's thinking also relies heavily on self-reflective means (Bandura, 1986). In this metacognitive activity, people judge the correctness of their predictive and operative thinking against the outcomes of their actions, the effects that other people's actions produce, what others believe, deductions from established knowledge and what necessarily follows from it.

Among the mechanisms of personal agency, none is more central or pervasive than people's beliefs in their capability to exercise some measure of control over their own functioning and over environmental events (Bandura, 1997). Efficacy beliefs are the foundations of human agency. Unless people believe they can produce desired results and forestall detrimental ones by their actions, they have little incentive to act or to persevere in the face of difficulties. Whatever other factors may operate as guides and motivators, they are rooted in the core belief that one has the power to produce effects by one's actions. Meta-analyses attest to the influential role played by efficacy beliefs in human functioning (Holden, 1991; Holden et al., 1990; Multon et al., 1991; Stajkovic & Luthans, 1998).

Perceived self-efficacy occupies a pivotal role in the causal structure of social cognitive theory because efficacy beliefs affect adaptation and change not only in their own right, but through their impact to other determinants (Bandura, 1997; Maddux, 1995; Schwarzer, 1992). Such beliefs influence whether people think pes-

simistically or optimistically and in ways that are self-enhancing or self-hindering. Efficacy beliefs play a central role in the self-regulation of motivation through goal challenges and outcome expectations. It is partly on the basis of efficacy beliefs that people choose what challenges to undertake, how much effort to expend in the endeavor, how long to persevere in the face of obstacles and failures, and whether failures are motivating or demoralizing. The likelihood that people will act on the outcomes they expect prospective performances to produce depends on their beliefs about whether or not they can produce those performances. A strong sense of coping efficacy reduces vulnerability to stress and depression in taxing situations and strengthens resiliency to adversity.

Efficacy beliefs also play a key role in shaping the courses lives take by influencing the types of activities and environments people choose to get into. Any factor that influences choice behavior can profoundly affect the direction of personal development. This is because the social influences operating in selected environments continue to promote certain competencies, values, and interests long after the decisional determinant has rendered its inaugurating effect. Thus, by choosing and shaping their environments, people can have a hand in what they become.

The rapid pace of informational, social, and technological change is placing a premium on personal efficacy for self-development and self-renewal throughout the life course. In the past, students' educational development was largely determined by the schools to which they were assigned. Nowadays, the Internet provides vast opportunities for students to control their own learning. They now have the best libraries, museums, laboratories, and instructors at their fingertips, unrestricted by time and place. Good self-regulators expand their knowledge and cognitive competencies; poor self-regulators fall behind (Zimmerman, 1990).

Self-regulation is also becoming a key factor

in occupational life. In the past, employees learned a given trade and performed it much the same way and in the same organization throughout their lifetime. With the fast pace of change, knowledge and technical skills are quickly outmoded unless they are updated to fit the new technologies. In the modern workplace, workers have to take charge of their self-development for a variety of positions and careers over the full course of their worklife. They have to cultivate multiple competencies to meet the ever-changing occupational demands and roles. Collective agentic adaptability applies at the organizational level as well as the workforce level. Organizations have to be fast learners and continuously innovative to survive and prosper under rapidly changing technologies and global marketplaces. They face the paradox of preparing for change at the height of success. Slow changers become big losers.

Health illustrates self-regulation in another important sphere of life. In recent years, there has been a major change in the conception of health from a disease model to a health model. Human health is heavily influenced by lifestyle habits and environmental conditions. This enables people to exercise some measure of control over their health status. Indeed, through self-management of health habits people reduce major health risks and live healthier and more productive lives (Bandura, 1997). If the huge health benefits of these few lifestyle habits were put into a pill, it would be declared a spectacular breakthrough in the field of medicine.

Agentic management of fortuity

There is much that people do designedly to exercise some measure of control over their self-development and life circumstances, but there is also a lot of fortuity in the courses lives take. Indeed, some of the most important determinants of life paths occur through the most trivial of circumstances. People are often inaugurated

into new developmental trajectories, marital partnerships, occupational careers, or untoward life paths through fortuitous circumstances. Consider the influence of fortuitous events in the formation of marital partnerships. A flight delayed by an unexpected storm creates a fortuitous encounter by two people who find themselves seated next to each other at the airport waiting for the weather to clear. This chance happening eventuates in a marriage, geographic relocation, and a shift in career trajectories, none of which would have occurred if the original flight had not been grounded by a sudden storm (Krantz, 1998). A book editor enters a lecture hall as it was rapidly filling up, for a talk on the «Psychology of Chance Encounters and Life Paths». He seizes an empty chair near the entrance. Some months later, he marries the woman he happened to sit next to. With only a momentary change in entry, seating constellations would have altered, and their lives would have taken quite different courses. A marital partnership was formed fortuitously at a talk devoted to fortuitous determinants of life paths (Bandura, 1982)!

A fortuitous event in socially mediated happenstances is defined as an unintended meeting of persons unfamiliar with each other. Although the separate chains of events in a chance encounter have their own determinants, their intersection occurs fortuitously rather than by design (Nagel, 1961). It is not that a fortuitous event is uncaused but, rather, there is a lot of randomness to the determining conditions of its intersection. Of the myriad fortuitous elements encountered in everyday life, many of them touch people only lightly, others leave more lasting effects, and still others thrust people into new life trajectories. The power of most fortuitous influences lies not so much in the properties of the events themselves, but in the constellation of transactional influences they set in motion (Bandura, 1982, 1998). On the personal side, people's attributes, belief systems, interests, and competencies influence whether or not a given chance encounter gets converted into a lasting relationship. On the social side, the impact of

fortuitous encounters partly depends on the holding and molding power of the social milieu into which people are fortuitously inaugurated.

Fortuity does not mean uncontrollability of its effects. There are ways people can capitalize on the fortuitous character of life. They can make chance happen by pursuing an active life that increases the level and type of fortuitous encounters they will experience. Chance favors the inquisitive and venturesome who go places, do things, and explore new activities (Austin, 1978). People also make chance work for them by cultivating their interests, enabling self-beliefs and competencies. These personal resources enable them to make the most of opportunities that arise unexpectedly from time to time. Pasteur (1854) put it well when he noted that «chance favors only the prepared mind». Self-development gives people a greater hand in shaping their destiny in the life paths they travel. These various proactive activities illustrate the agentic management of fortuity.

Fortuitous factors receive little notice in causal analyses of developmental trajectories, but they figure prominently in prescriptions for realizing valued futures and safeguarding against detrimental ones (Bandura, 1995, 1997; Hamburg, 1992; Masten et al., 1990; Rutter, 1990). On the self-development side, the efforts center on cultivating personal resources that enable individuals to exploit promising fortuities. On the safeguarding side, individuals are helped to expand the self-regulative capabilities that enable them to resist fortuitous social traps leading down detrimental paths, and to extricate themselves from such predicaments should they become enmeshed in them.

Modes of human agency

Theorizing and research on human agency has been essentially confined to personal agency exercised individually. However, this is not the only way in which people bring their influence to bear on events that affect how they live their lives. Social cognitive theory distinguishes among three

different modes of human agency: personal, proxy, and collective.

The preceding analyses centered on the nature of direct personal agency and the cognitive, motivational, affective, and choice processes through which it is exercised to produce given effects. In many spheres of functioning people do not have direct control over the social conditions and institutional practices that affect their everyday lives. Under these circumstances, they seek their well-being, security, and valued outcomes through the exercise of proxy agency. In this socially mediated mode of agency people try by one means or another to get those who have access to resources or expertise or who wield influence and power to act at their behest to secure the outcomes they desire. No one has the time, energy, and resources to master every realm of everyday life. Successful functioning necessarily involves a blend of reliance on proxy agency in some areas of functioning to free time and effort to manage directly other aspects of one's life (Baltes, 1996; Brandstädter, 1992). For example, children turn to parents, marital partners to spouses, and citizens to their legislative representatives to act for them. Proxy agency relies heavily on perceived social efficacy for enlisting the mediative efforts of others.

People also turn to proxy control in areas in which they can exert direct influence when they have not developed the means to do so, they believe others can do it better, or they do not want to saddle themselves with the burdensome aspects that direct control entails. Personal control is neither an inherent drive nor universally desired, as is commonly claimed. There is an onerous side to direct personal control that can dull the appetite for it. The exercise of effective control requires mastery of knowledge and skills attainable only through long hours of arduous work. Moreover, maintaining proficiency under the ever-changing conditions of life demands continued investment of time, effort and resources in self-renewal.

In addition to the hard work of continual self-development, the exercise of personal control often carries heavy responsibilities, stressors, and risks. People are not especially eager to shoulder the burdens of responsibility. All too often they surrender control to intermediaries in activities over which they can command direct influence. They do so to free themselves of the performance demands and onerous responsibilities that personal control entails. Proxy agency can be used in ways that promote self-development or impede the cultivation of personal competencies. In the latter case, part of the price of proxy agency is a vulnerable security that rests to the competence, power, and favors of others.

People do not live their lives in isolation. Many of the things they seek are achievable only through socially interdependent effort. Hence, they have to work in coordination with others to secure what they cannot accomplish on their own.

Social cognitive theory extends the conception of human agency to collective agency (Bandura, 1997). People's shared belief in their collective power to produce desired results is a key ingredient of collective agency. Group attainments are the product not only of the shared intentions, knowledge, and skills of its members, but also of the interactive, coordinated, and synergistic dynamics of their transactions. Because the collective performance of a social system involves transactional dynamics, perceived collective efficacy is an emergent group-level property, not simply the sum of the efficacy beliefs of individual members. However, there is no emergent entity that operates independently of the beliefs and actions of the individuals who make up a social system. It is people acting conjointly on a shared belief, not a disembodied group mind that is doing the cognizing, aspiring, motivating, and regulating. Beliefs of collective efficacy serve functions similar to those of personal efficacy beliefs and operate through similar processes (Bandura, 1997).

Evidence from diverse lines of research attests to the impact of perceived collective efficacy on group functioning (Bandura, 2000). Some of these

studies have assessed the effects of perceived collective efficacy instilled experimentally to differential levels. Other studies have examined the effects of naturally developed beliefs of collective efficacy on the functioning of diverse social systems, including educational systems, business organizations, athletic teams, combat teams, urban neighborhoods, and political action groups. The findings taken as a whole show that the stronger the perceived collective efficacy, the higher the groups' aspirations and motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, the higher their morale and resilience to stressors, and the greater their performance accomplishments.

Theorizing about human agency and collectivities is replete with contentious dualisms that social cognitive theory rejects. These dualities include personal agency versus social structure, self-centered agency versus communality, and individualism versus collectivism. The agency-sociostructural duality pits psychological theories and sociostructural theories as rival conceptions on human behavior or as representing different levels and temporal proximity of causation. Human functioning is rooted in social systems. Therefore, personal agency operates within a broad network of sociostructural influences. For the most part, social structures represent authorized systems of rules, social practices, and sanctions designed to regulate human affairs. These sociostructural functions are carried out by human beings occupying authorized roles (Giddens, 1984).

Within the rule structures of social systems, there is a lot of personal variation in their interpretation, enforcement, adoption, circumvention, and even active opposition (Burns & Dietz, 2000). These transactions do not involve a duality between a reified social structure disembodied from people and personal agency, but a dynamic interplay between individuals and those who preside over the institutionalized operations of social systems. Social cognitive theory explains

human functioning in terms of triadic reciprocal causation (Bandura, 1986). In this model of reciprocal causality, internal personal factors in the form of cognitive, affective, and biological events, behavioral patterns, and environmental influences all operate as interacting determinants that influence one another bidirectionally. The environment is not a monolithic entity. Social cognitive theory distinguishes between three types of environmental structures (Bandura, 1997). They include the imposed environment, selected environment, and constructed environment. These different environmental structures represent gradations of changeability requiring the exercise of differing scope and focus of personal agency.

In social cognitive theory, sociostructural factors operate through psychological mechanisms of the self system to produce behavioral effects. Thus, for example, economic conditions, socioeconomic status, and educational and family structures affect behavior largely through their impact on people's aspirations, sense of efficacy, personal standards, affective states, and other self-regulatory influences, rather than directly (Baldwin et al., 1989; Bandura, 1993; Bandura et al., 1996a, 2000a; Elder & Ardel, 1992). Nor can sociostructural and psychological determinants be dichotomized neatly into remote and proximate influences. Poverty, indexed as low socioeconomic status, is not a matter of multilayered or distal causation. Lacking the money to provide for the subsistence of one's family impinges pervasively on everyday life in a very proximal way. Multicausality involves codetermination of behavior by different sources of influence, not causal dependencies between levels.

The self system is not merely a conduit for sociostructural influences. Although the self is socially constituted, by exercising self-influence human agents operate generatively and proactively, not just reactively, to shape the character of their social systems. In these agentic transactions, people are producers as well as products of social systems. Personal agency and social structure operate interdependently. Social

structures are created by human activity, and sociostructural practices, in turn, impose constraints and provide enabling resources and opportunity structures for personal development and functioning.

Another disputable duality inappropriately equates self-efficacy with self-centered individualism feeding selfishness, and then pits it against communal attachments and civic responsibility. A sense of efficacy does not necessarily exalt the self or spawn an individualistic lifestyle, identity, or morality that slights collective welfare. Through unwavering exercise of commanding self-efficacy, Gandhi mobilized a massive collective force that brought about major sociopolitical changes. He lived ascetically, not self-indulgently. If belief in the power to produce results is put in the service of relational goals and beneficial social purposes, it fosters a communal life rather than eroding it. Indeed, developmental studies show that a high sense of efficacy promotes a prosocial orientation characterized by cooperativeness, helpfulness, and sharing, with a vested interest in each other's welfare (Bandura et al., 1996a; Bandura et al., 1999, 2000b).

Another dualistic antithesis inappropriately equates self-efficacy with individualism and pits it against collectivism at a cultural level (Schooler, 1990). Cultures are not static monolithic entities, as the stereotypic portrayals would lead one to believe. These global cultural classifications mask intracultural diversity as well as the many commonalities among people of different cultural backgrounds. Both individualistic and collectivistic sociocultural systems come in a variety of forms (Kim et al., 1994). There is substantial generational and socioeconomic heterogeneity in communality among individuals in different cultural systems, and even greater intraindividual variation across social relationships with family members, friends, and colleagues (Matsumoto et al., 1996). Moreover, people express their cultural orientations conditionally rather than invariantly, behaving communally under some incentive structures and individualistically under others (Yamagishi, 1988).

Bicultural contrasts, in which individuals from a single collectivistic locale are compared on global indices to individuals from a single individualistic one, can spawn a lot of misleading generalizations.

If people are to pool their resources and work together successfully, the members of a group have to perform their roles and coordinated activities with a high sense of efficacy. One cannot achieve an efficacious collectivity with members who approach life consumed by nagging self-doubts about their ability to succeed and their staying power in the face of difficulties. Personal efficacy is valued, not because of reverence for individualism, but because a strong sense of efficacy is vital for successful functioning regardless of whether it is achieved individually or by group members working together. Indeed, a strong sense of personal efficacy to manage one's life circumstances and to have a hand in effecting societal changes contributes substantially to perceived collective efficacy (Fernández-Ballesteros et al., 2000).

Cross-cultural research attests to the general functional value of efficacy beliefs. Perceived personal efficacy contributes to productive functioning by members of collectivistic cultures just as it does to functioning by people raised in individualistic cultures (Earley, 1993, 1994). However, cultural embeddedness shapes the ways in which efficacy beliefs are developed, the purposes to which they are put, and the sociostructural arrangements through which they are best exercised. People from individualistic cultures feel most efficacious and perform best under an individually oriented system, whereas those from collectivistic cultures judge themselves most efficacious and work most productively under a group-oriented system. A low sense of coping efficacy is as stressful in collectivistic cultures as in individualistic ones (Matsui & Onglatco, 1991).

There are collectivists in individualistic cultures and individualists in collectivistic cultures. Regardless of cultural background, people achieve the greatest personal efficacy and productivity when their psychological orientation is congruent

with the structure of the social system (Earley, 1994). Both at the societal and individual level of analysis, a strong perceived efficacy fosters high group effort and performance attainments.

Cultures are no longer insular. Transnational interdependencies and global economic forces are weakening social and cultural normative systems, restructuring national economies and shaping the political and social life of societies (Keohane, 1993; Keohane & Nye, 1977). Social bonds and communal commitments that lack marketability are especially vulnerable to erosion by global market forces unfettered by social obligation. Because of extensive global interconnectedness, what happens economically and politically in one part of the world can affect the welfare of vast populations elsewhere. Moreover, advanced telecommunications technologies are disseminating ideas, values and styles of behavior transnationally at an unprecedented rate. The symbolic environment feeding off communication satellites is altering national cultures and homogenizing collective consciousness. With further development of the cyberworld, people will be even more heavily embedded in global symbolic environments. In addition, mass migrations of people are changing cultural landscapes. This growing ethnic diversity accords functional value to bicultural efficacy to navigate the demands of both one's ethnic subculture and that of the larger society.

These new realities call for broadening the scope of cross-cultural analyses beyond the focus on the social forces operating within the boundaries of given societies to the forces impinging upon them from abroad. With growing international embeddedness and interdependence of societies, and enmeshment in the Internet symbolic culture, the issues of interest center on how national and global forces interact to shape the nature of cultural life. As globalization reaches ever deeper into people's lives, a strong sense of collective efficacy to make transnational systems work for them becomes critical to furthering their common interests.

Underminers of collective efficacy in changing societies

The revolutionary advances in electronic technologies have transformed the nature, reach, and loci of human influence. These new social realities provide vast opportunities for people to bring their influence to bear on their personal development and to shape their social future. However, many of the contemporary conditions of life undermine the development and maintenance of collective efficacy. Distal transnational influences have wide-ranging consequential local effects on people's lives. These transnational forces are hard to disentangle, let alone control. They challenge the efficacy of governmental systems to exert a determining influence on their own economic and national life. As the need for efficacious collective civic action grows, so does the sense of collective powerlessness. Under the new realities of growing transnational control, nation states increase their controlling leverage by merging into larger regional units such as the European Union. However, these regional marriages do not come without a price. Paradoxically, to gain international control, nations have to negotiate reciprocal pacts that require some loss of national autonomy and changes in traditional ways of life (Keohane, 1993).

Everyday life is increasingly regulated by complex technologies that most people neither understand nor believe they can do much to influence. The very technologies they create to control their life environment paradoxically can become a constraining force that, in turn, controls how they think and behave. The social machinery of society is no less challenging. The beneficiaries of existing sociostructural practices wield their influence to maintain their vested interests. Long delays between action and noticeable results further discourage efforts at socially significant changes. In the metaphoric words of John Gardner, «Getting things done socially is no sport for the short-winded».

Social efforts to change lives for the better

require merging diverse self-interests in support of common core values and goals. Recent years have witnessed growing social fragmentation into separate interest groups, each flexing its own factional efficacy. Pluralism is taking the form of militant factionalism. As a result, people are exercising greater factional influence but achieving less collectively because of mutual immobilization. In addition, mass migration can further contribute to social fragmentation. Societies are thus becoming more diverse and harder to unite around a national vision and purpose.

The magnitude of human problems also undermines perceived efficacy to find effective solutions for them. Worldwide problems of growing magnitude instill a sense of paralysis that there is little people can do to reduce such problems. Global effects are the products of local actions. The strategy of «Think globally, act locally» is an effort to restore in people a sense of efficacy that they can make a difference. Macrosocial applications of sociocognitive principles via the electronic media illustrate how small collective efforts can have substantial impact on such urgent global problems as soaring population growth (Bandura, 1997; Singhal & Rogers, 1999).

Emerging primacy of human agency in biosocial coevolution

There is growing unease about progressive divestiture of different aspects of psychology to biology. Biological determinants of human behavior are being widely heralded, and psychosocial dynamics are being downgraded for neurodynamics. It is feared that as we give away more and more psychology to disciplines lower down on the food chain, there will be no core psychological discipline left. Disciplinary fragmentation, dispersion, and absorption in neuroscience, we are told, may be our discipline's destiny. Contrary to the proclamations of the divestitive oracles, psychology is the one

discipline that uniquely encompasses the complex interplay between intrapersonal, biological, interpersonal, and sociostructural determinants of human functioning. Psychology is, therefore, best suited to advance understanding of the integrated biopsychosocial nature of humans and how they manage and shape the everyday world around them. It is ironic that an integrative core discipline, which deals with the whole person acting in and on environments, should consider fractionating and farming out subpersonal parts to other disciplines. The field of psychology should be articulating a broad vision of human beings, not a reductive fragmentary one.

The divestitive line of thinking is fueled by conceptual reductionism, nature-nurture analytic dualism, and one-sided evolutionism. As previously noted, mental events are brain activities, but physicality does not imply reduction of psychology to biology. Knowing how the biological machinery works tells one little about how to orchestrate that machinery for diverse purposes. To use an analogy, the «psychosocial software» is not reducible to the «biological hardware». Each is governed by its own set of principles that must be studied in their own right.

Much of psychology is concerned with discovering principles about how to structure environments to promote given psychosocial changes and levels of functioning. This exogenous subject matter does not have a counterpart in neurobiological theory and, hence, psychological laws are not derivable from it. For example, knowledge of the locality and brain circuitry subserving learning can say little about how best to devise conditions of learning in terms of level of abstractness, novelty, and challenge; how to provide incentives to get people to attend to, process, and organize relevant information; in what modes to present information; and whether learning is better achieved independently, cooperatively, or competitively. The optimal conditions must be specified by psychological principles.

Mapping the activation of the neuronal circuitry subserving Martin Luther King's «I Have a Dream» speech would tell us little about its powerful socially inspirational nature, the agentic deliberative effort that went into its creation, and the civic-minded passion that energized its origination and public declaration. Nor will analyses at the molecular, cellular and biochemical levels explain these agentic activities. There is little at the neuronal level that can tell us how to develop efficacious parents, teachers, executives, or social reformers.

Psychological principles cannot violate the neurophysiological capabilities of the systems that subserve them. However, the psychological principles need to be pursued in their own right. Were one to embark on the slippery slope of reductionism, the journey would traverse biology and chemistry and eventually end in atomic subparticles. Because of emergent properties across levels of complexity, neither the intermediate locales nor the final stop in atomic subparticles supply the psychological laws of human behavior.

The biologizing of psychology, which lately has become highly fashionable, is also being promoted by uncritical adoption of one-sided evolutionism. Not to be outdone, the geneticization of human behavior is being promoted more fervently by psychological evolutionists than by biological evolutionists (Buss & Schmitt, 1993; Bussey & Bandura, 1999). In these analyses, human behavior is readily attributed to determinative ancestral programming and universalized traits. Biological evolutionists underscore the diversifying selection pressures for adaptiveness of different types of ecological milieus (Dobzhansky, 1972; Fausto-Sterling, 1992; Gould, 1987). Socially constructed milieus differ markedly so no single mode of social adaptation fits all situations.

Ancestral origin of bodily structures and biological potentialities and the determinants governing contemporary behavior and social practices are quite different matters. Because

evolved potentialities can serve diverse purposes, ancestral origin dictates neither current social function nor a singular sociostructural arrangement. All too often, the multicausality of human behavior is misleadingly framed in terms of partitioning behavioral variance into percent nature and percent nurture. This analytic dualism is mistaken for several reasons: It disregards the intricate interdependence of nature and nurture. Moreover, socially constructed nurture has a hand in shaping human nature.

Social cognitive theory acknowledges the influential role of evolved factors in human adaptation and change, but it rejects one-sided evolutionism in which evolved biology shapes behavior but the selection pressures of social and technological innovations on biological evolution get ignored. In the bidirectional view of evolutionary processes, environmental pressures fostered changes in biological structures and upright posture conducive to the development and use of tools. These endowments enabled an organism to manipulate, alter, and construct new environmental conditions. Environmental innovations of increasing complexity, in turn, created new selection pressures for the evolution of cognitive capacities and specialized biological systems for functional consciousness, thought, language, and symbolic communication.

Human evolution provides bodily structures and biological potentialities, not behavioral dictates. Psychosocial influences operate through these biological resources to fashion adaptive forms of behavior. Having evolved, the advanced biological capacities can be used to create diverse cultures – aggressive, pacific, egalitarian, or autocratic. Gould (1987) builds a strong case that biology sets constraints that vary in nature, degree, and strength in different activity domains, but in most spheres of human functioning biology permits a broad range of cultural possibilities. He argues cogently that evidence favors a potentialist view over a determinist view. In this insightful analysis, the major explanatory battle is not between nature and nurturé as commonly

framed, but whether nature operates as a determinist or as a potentialist. For example, tall individuals have the potential to become successful basketball players. But tallness does not ordain basketball pursuits. I seriously doubt that the genetic make-up of the Nazi Germans who committed unprecedented barbarity is really different from the genetic make-up of peaceful Swiss residing in the German canton of Switzerland. People possess the biological potential for aggression, but the answer to the cultural variation in aggressiveness lies more in ideology than in biology.

Gould makes the further interesting point that biological determinism is often clothed in the language of interactionism to make it more palatable. The bidirectional biology-culture coevolution is acknowledged, but then evolved biology is portrayed as the ruling force. The cultural side of this two-way causation, in which genetic make-up is shaped by the adaptational pressures of socially constructed environments, receives little notice. Biological determinism is also often clothed in the language of changeability: The malleability of evolved dispositions is acknowledged, but determinative potency is then ascribed to them with caution against efforts to change existing sociostructural arrangements and practices allegedly ruled by the evolved dispositions. Such efforts are regarded as not only doomed to failure but socially harmful because they go against the rule of nature (Wilson, 1998).

In Gould's view (1987), biology has culture on a «loose leash», whereas Wilson argues that, biology has culture on a «tight leash». How human nature is construed determines the extent to which obstructions to sociostructural changes are sought in genetic mismatch or in the counterforce of entrenched vested interests. Biological determinists favor the rule of nature, whereas biological potentialists, who regard human nature as permitting a range of possibilities, give greater weight to the rule of distributed opportunities, privileges, and power. Thus, a biological determinist view highlights

inherent constraints and limitations. A biological potentialist view of human nature emphasizes human possibilities.

There is much genetic homogeneity across cultures but vast diversity in belief systems and conduct. Given this variability, genetic coding that characterizes humans underscores the power of the environment orchestrated through agentic action. Aggression, which is allegedly genetically programmed as a biological universal, is a good case in point. Wide intercultural diversity challenges the view that people are inherently aggressive. There are fighting cultures that breed aggression by modeling it pervasively, attaching prestige to it and according it functional value for gaining social status, material benefits, and social control. There are also pacific cultures in which interpersonal aggression is a rarity because it is devalued, rarely modeled, and has no functional value (Alland, 1972; Bandura, 1973; Sanday, 1981).

Intracultural diversity also calls into question aggression as an innate human nature. The United States is a relatively violent society, but American Quakers, who are fully immersed in the culture, adopt pacifism as a way of life. The third form of variability involves rapid transformation of warring societies into peaceful ones. The Swiss used to be the main suppliers of mercenary fighters in Europe, but as they transformed into a pacific society their militaristic vestige is evident only in the plumage of the Vatican guards. For ages the Vikings plundered other nations. After a prolonged war with Russia that exhausted Sweden's resources, the populous rose up and forced a constitutional change that prohibited kings from starting wars (Moerk, 1995). This political act promptly transformed a fighting society into a peaceable one that has served as a mediator for peace among warring nations. This rapid cultural metamorphosis underscores the power of nurture. In cross-cultural comparisons, Sweden ranks at the very bottom of all forms of violence.

A biologically deterministic view has even thornier problems with the rapid pace of social

change. People have changed little genetically over recent decades, but they have changed markedly through rapid cultural and technological evolution in their beliefs, mores, social roles, and styles of behavior. Social systems and lifestyles are being altered by social means rather than by reliance on the slow, protracted process of biological selection. As Dobzhansky (1972) puts it succinctly, the human species has been selected for learnability and plasticity of behavior adaptive to remarkably diverse habitats, not for behavioral fixedness. The pace of social change gives testimony that biology, indeed, permits a range of possibilities.

To say that a hallmark of humans is their endowed plasticity is not to say that they have no nature (Midgley, 1978), or that they come structureless and biologically limitless. The plasticity, which is intrinsic to the nature of humans, depends upon specialized neurophysiological structures and mechanisms that have evolved over time. These advanced neural systems are specialized for channeling attention, detecting the causal structure of the outside world, transforming that information into abstract representations, and integrating and using them for adaptive purposes. These evolved information processing systems provide the capacity for the very agentic characteristics that are distinctly human-generative symbolization, forethought, evaluative self-regulation, reflective self-consciousness, and symbolic communication.

Neurophysiological systems have been shaped by evolutionary pressures, but people are not just reactive products of selection pressures. Other species are heavily innately programmed for stereotypic survival in a particular habitat. In contrast, human lifestyles are, in large part, experientially fashioned within biological limits rather than come ready made. The exercise of agentic capabilities is a prime player in the human coevolution process. People are not only reactors to selection pressures, but they are producers of new ones at an increasingly dizzying pace.

Through agentic action, people devise ways

of adapting flexibly to remarkably diverse geographic, climatic and social environments; they figure out ways to circumvent physical and environmental constraints, redesign and construct environments to their liking, create styles of behavior that enable them to realize desired outcomes, and pass on the effective ones to others by social modeling and other experiential modes of influence. By these inventive means, people improve their odds in the fitness survival game. Growth of knowledge is increasingly enhancing human power to control, transform, and create environments of increasing complexity and consequence. We build physical technologies that drastically alter how we live our daily lives. We create mechanical devices that compensate immensely for our sensory and physical limitations. We develop medical and psychological methods that enable us to exert some measure of control over our physical and psychosocial lives. Through contraceptive ingenuity that disjoined sex from procreation, humans have outwitted and taken control over their evolved reproductive system. Carl Djerassi, who begot the birth control pill, predicts that further developments in reproductive technologies will separate sex from fertilization by storing eggs and injecting sperm in vitro for uterine reinsertion and childbearing at a time of one's choosing (Levy, 2000).

Humans have created biotechnologies for replacing defective genes with modified ones and for changing the genetic make-up of plants and animals by implanting genes from different sources. In a budding biotechnology that is forging ahead in ways that bypass evolutionary genetic processes, we are now cloning clones and exploring methods that could alter the genetic codes of humans. As people devise ever more powerful technologies that enable them to fashion some aspects of their nature, the psychosocial side of coevolution is gaining ascendancy. Thus, through agentic genetic engineering, humans are becoming major agents of their own evolution, for better or for worse.

With further development of biotechnology, we face the prospect that more direct social construction of human nature through genetic design of human beings for desired properties will increasingly command our attention and ethical concerns.

What is technologically possible eventually gets applied. As previously noted, the genetic factors provide only potentialities, not the finished psychosocial attributes. However, there is no shortage of individuals with the resources and belief in genetic determinism to underwrite attempts at genetic engineering of human nature. The values to which we subscribe and the social systems we devise to oversee the uses to which our powerful technologies are put will play a vital role in what we become and how we shape our destiny.

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