

Control and Efficacy as Interdisciplinary Bridges

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Control and efficacy are ideally suited as “bridges” or linking constructs for social scientists working at different levels of analysis. Control and efficacy depend on the fit between individuals and the social systems in which they are embedded, and control and efficacy have measurable effects on neurotransmitter levels and endocrine responses. This article presents an interdisciplinary perspective on control and efficacy. The authors survey the history of control-related constructs in psychology, from their roots in animal learning to the present cognitive focus on beliefs about control. They then point out connections “up” to the sociological level and “down” to the physiological level. They propose a taxonomy of 6 useful constructs organized into 3 perspectives: motivational, cognitive, and systemic. Such a multilevel, multidisciplinary approach may be particularly useful for approaching large real-world problems such as improving schools or neighborhoods.

People generally like to control their environments and their fates. They fight revolutions,

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consult astrologers, and buy air conditioners with remote controls. They believe that they have control in many cases in which they have none (Langer, 1983), and they live longer, healthier lives when their sense of control is augmented (Langer & Rodin, 1976; Rodin & Langer, 1977; Taylor, 1989).

The construct of control has played a major role in modern psychology. The recognition of an intrinsic motivation to affect the environment was an important challenge to behaviorism (White, 1959), and research on control has continued steadily since the 1950s. Lefcourt's (1966) review of the literature on internal versus external control of reinforcement is one of the 10 most cited articles ever published in the *Psychological Bulletin*, and control has become a central topic in social, developmental, clinical, health, and community psychology, as well as in several areas of sociology.

But research on control has in a way been hampered by its own success. Control is relevant to so many areas of investigation that researchers have developed dozens of control-related constructs and measures, including locus of control, learned helplessness, self-efficacy, mastery, personal causation, personal competence, self-determination, autonomy, agency, empowerment, and instrumentality. Skinner (1996) recently helped to clarify the situation by publishing a guide to more than 100 control-related constructs. Skinner's guide organizes a tremendous amount of control-related research, but it

also reveals an implicit assumption guiding that research: that it is people's *beliefs* about control that really matter. Psychological research on control has focused primarily on people's consciously accessible and reportable beliefs and expectancies about the causal links among agents, means, and ends.

The major claim of the present article is that control should be viewed in a broader and more interdisciplinary framework. The study of control has been narrowed by the cognitive revolution to the study of control beliefs, thereby losing touch both with the motivational roots of the field in animal learning and with the importance of control in sociological thinking. In this article, we describe three perspectives on control that can help psychologically oriented researchers move "up," to the sociological level, and "down," to the biological level. Control and efficacy therefore provide interdisciplinary bridges for the social sciences.

In the sections that follow, we begin with a brief history of control constructs in psychology, focusing on the shift from motivational to cognitive approaches. We then move up to the sociological level, showing how control serves as a "mind-society" bridge, and down to the biological level, showing how control serves as a "mind-body" bridge. Finally, we present a taxonomy of control-related constructs whose three main branches represent three overarching perspectives on human behavior: motivational, cognitive, and systemic.

Control in the History of Psychology

The following literature review is highly selective, taking a historical view of the four major conceptualizations that have guided psychological research. More comprehensive reviews of current conceptualizations are available in Bandura (1997) and Skinner (1995).

White's Effectance Motivation

The dominant schools of psychology at midcentury—behaviorism and psychoanalysis—both denied the importance of human agency. They viewed behavior as determined by a few powerful drives whose expression was shaped by prior experience and present stimuli. Yet, within both schools, inexplicable findings were

arising that could not be made to fit into orthodox drive models.

In 1959, Robert White surveyed both literatures and concluded that they had each run up against an important motivation that he labeled *effectance*, which is a striving for "competence." Animal learning researchers were finding that the three drives of hunger, thirst, and sex were not sufficient to explain animal behavior. Rats, dogs, and monkeys would work, and even cross an electric grid, for the privilege of exploring new territory or examining and manipulating novel objects. Some researchers proposed that the list of drives ought to be expanded to include drives for exploration (Butler, 1958), activity (Kagan & Berkun, 1954), and manipulation (Harlow, 1953).

Simultaneously, psychoanalytic theorists were finding that the two basic instincts of libido and aggression were not sufficient to explain children's behavior. Children showed a distinct pleasure in learning and perfecting skills, leading Hendrick (1942) to propose an additional "instinct to master," which he characterized as "an inborn drive to do and to learn how to do" (as cited in White, 1959, p. 307). The instinct to master yields pleasure when an efficient action "enables the individual to control and alter his environment" (White, 1959, p. 307). Similarly, Erikson (1953) proposed that children need "a sense of being able to make things and make them well and even perfectly: This is what I call the *sense of industry*" (as cited in White, 1959, pp. 311–312).

White's broad survey went on to describe similar findings and proposals in other areas of psychology. Murray's (1938) well-known taxonomy of needs included needs for "achievement" and "construction." Maslow (1955) compared deficiency motivations with "growth motivations," placing "self-actualization" at the top of his hierarchy of needs. In developmental psychology, Piaget (1952) remarked on the child's special interest in objects that are affected by his or her own movements, harkening back to Groos's (1901) analysis of play, and the child's "joy in being a cause."

It appeared that researchers in many areas of psychology were finding that they needed more agent-centered and growth-oriented theories. Humans and other mammals seemed to be intrinsically motivated to explore their environments, to interact with them, and to affect them.

In humans, this motivation seemed to take the form of a striving for skill acquisition, mastery, or competence. White (1959) argued that an innate striving for competence and mastery made good evolutionary sense, particularly for human beings, for whom "so little is provided innately and so much has to be learned through experience" (p. 329). White labeled this motivation *effectance* and stated that its aim, or its particular pleasure, is the "feeling of efficacy."

But whereas White placed effectance on a par with hunger as a basic human motivation, he stressed that effectance could not simply be added to the list of deficit drives, because it does not aim for homeostasis. Effectance is, rather, the natural condition of human beings moving about in the world, except during "episodes of homeostatic crisis," when we call on the skills we have been so assiduously mastering. There is no minimum daily requirement for feelings of efficacy, but neither is there any limit, point of satiety, or end of striving for competence: "Because there is no consummatory climax, satisfaction has to be seen as lying in a considerable series of transactions, in a trend of behavior rather than a goal that is achieved" (White, 1959, p. 322).

A number of theorists have extended White's motivational view of control and efficacy. DeCharms (1968) asserted that "man's primary motivational propensity is to be effective in producing changes in his environment. Man strives to be a causal agent. His nature commits him to this path and his very life depends on it" (p. 269). Brehm (1966; Wortman & Brehm, 1975) also thought there is an intrinsic need for control and that whenever the ability to control one's outcomes is taken away, the emotional response is *reactance*, a state involving increased arousal and anxiety during which the person attempts to recover control. Harter (1978) recast White's model in developmental terms, showing how a child's effectance motive might be strengthened or weakened by the actions of socializing agents. And the Rochester Human Motivation Research Group developed White's motivational approach into a more modern theory of intrinsic motivation, including innate needs for competence, autonomy, and relatedness (Connell, 1990; Deci, 1975; Deci & Ryan, 1985; Skinner & Connell, 1986).

In summary, White (1959) criticized the drive theories of the 1950s, yet he stayed within a

motivational framework. He developed an enhanced motivational perspective in which people and animals have agentic motivations. We now move on to the next wave of theorists who explored human agency, yet who did so using the tools of the new cognitive revolution: beliefs, expectancies, and cognitive structures.

Rotter's Internal-External Locus of Control for Reinforcement

Social learning theory of the 1950s and 1960s attempted to integrate older reinforcement theories with newer cognitive approaches. Julian Rotter and his colleagues at Ohio State University were trying to predict how reinforcements changed expectancies in human subjects, but they repeatedly found that these changes varied systematically both as a function of the nature of the situation and as a characteristic of the person being reinforced (Rotter, 1966, 1975). The locus of control construct was initially proposed as a way of capturing that systematic variation. As a situational variable, situations that produced the belief that reinforcement was under outside control were called external control situations, and those that produced the belief that reinforcement was under the individual's own control were called internal control situations. As an individual-differences variable, it referred to the finding that people exposed to the same set of contingencies would vary in their tendency to expect that reinforcements were contingent entirely on their own behavior (internal locus of control), or that reinforcements were the result of luck, chance, or fate or were under the control of powerful others.

Scales were developed to measure individual differences in generalized control expectancies, and early factor analyses suggested that there was one large factor and several small factors. The small factors were initially dropped, leading to Rotter's (1966) well-known 23-item I-E Locus of Control Scale. Research with this and other scales demonstrated that an internal locus of control was generally associated with positive outcomes in health, sports, work, marriage, academic achievement, psychological adjustment, and other domains (Lefcourt, 1981, 1992).

Research with the locus of control construct grew rapidly in the 1960s and 1970s, in part because the theory fit with the zeitgeist in two

important ways (Lefcourt, 1992). Within psychology, the theory fit perfectly with the cognitive revolution's shift from motivational interpretations of deficit-driven behavior to cognitive explanations based on beliefs and attitudes. Social learning theory had already gained respectability among academic psychologists, and Rotter's approach preserved the familiar language of learning and reinforcement. The introduction of generalized expectancies of reinforcement therefore provided an easy bridge into the new world of cognition, where self-aware individuals processed information (about reinforcement) before acting.

The theory also fit in important ways with the political zeitgeist of the 1960s. Older motivational interpretations of underclass behavior led to the conclusion that there was something wrong with poor people, such as a lack of a work ethic or of achievement motivation. The civil rights movement, however, had begun to point out the devastating effects of oppressive social conditions and lack of opportunity. The Coleman report (Coleman et al., 1966) supported this view, finding few differences between the achievement values or desires of Black and White children but apparent differences in their locus of control (see also Gurin, Gurin, Lao, & Beattie, 1969). The locus of control construct was thus well suited for sociological and social policy discussion. Unresponsive social, political, and economic structures taught Black Americans to have an external locus of control, whereas those same structures, being more responsive to White Americans, taught them to have an internal locus of control. There was an obvious relationship between locus of control and sociological constructs such as alienation and empowerment.

Seligman's Learned Helplessness

Dissatisfaction with traditional learning theories grew throughout the 1960s. Two important challenges came out of Richard Solomon's laboratory at the University of Pennsylvania, where it was demonstrated that animals extract information from their environment about contingency and controllability. In Pavlovian conditioning, Rescorla (1967) demonstrated that animals are not affected by the mere contiguity of a conditioned stimulus and an unconditioned stimulus, as had been previously thought. Rather, an

animal's responses are exquisitely sensitive to the degree of contingency of the conditioned stimulus on the unconditioned stimulus.

In studies of operant conditioning, Overmeier and Leaf (1965) had discovered by accident that dogs pretrained to associate a light with unavoidable shock while restrained in a harness were then unable to learn how to escape shock in a shuttlebox. Dogs that had not been given unavoidable shock learned the avoidance task easily. There was no clear explanation for this effect within standard operant models, so two graduate students, Martin Seligman and Steven Maier, came up with their own. Seligman and Maier (1967) argued that animals do not just learn to make responses to stimuli; rather, they actually learn the degree to which they can control an outcome. Dogs that have learned that electric shock is not controllable make no effort to control it, even in a new situation in which control is possible. The dogs have learned that they are helpless, and their helplessness generalizes to new situations in which it is not appropriate.

In the 1970s, research on learned helplessness moved beyond the animal learning lab and looked increasingly at the effects of uncontrollability on people (Hiroto & Seligman, 1975; Seligman, 1975). The same basic effects were found, yet it quickly became apparent that an additional level of complexity was at work and that the raw facts of controllability and uncontrollability were not sufficient to explain human behavior. People's interpretations and attributions kept interfering. This realization occurred at the same time that attribution theory was becoming the dominant paradigm within social psychology, and thus was born the "attributional reformulation" of the learned helplessness model (Abramson, Seligman, & Teasdale, 1978).

Attribution theorists (Heider, 1958; Jones & Davis, 1965) see people as striving to make sense of their experiences and to assign causes to events. The attributional perspective was particularly compatible with the learned helplessness paradigm because attributions were seen to be a form of "cognitive control" (Kelly, 1967). People feel particularly powerless when they cannot understand what is happening around them. The attributional process relieves this paralyzing confusion and is a prerequisite for effective action. Abramson et al. (1978) looked at the attributions people make about bad events, particularly their controllability. They selected

three parameters of causal explanation as the critical cognitive mediators between events in the world and human helplessness and depression: (a) locus of causality as either internal to the self or external, (b) whether the causes of an event are perceived to be stable over time or unstable, and (c) whether causes are perceived to be global or specific.

With these three parameters in hand, Abramson, Seligman, and Teasdale brought learned helplessness fully into the age of cognition. The new focus of the theory was the mediating variable of *explanatory style* (initially called *attributional style*). Explanatory style refers to a person's habitual way of explaining events in her or his life on the three parameters just described. A person who habitually invokes internal, stable, and global factors to explain failures and difficulties is said to have a "depressive explanatory style" and is most at risk of becoming helpless and depressed in the face of stressors and uncontrollable circumstances.

Bandura's Self-Efficacy

Albert Bandura's notion of *self-efficacy* (1977, 1982, 1995, 1997) bears some resemblance to Rotter's locus of control and to Seligman's learned helplessness. All three constructs grew out of a dissatisfaction with traditional learning theories, and all three theorists pushed for a more cognitively oriented approach in which beliefs about control and agency guide behavior. But there are two principal differences that make self-efficacy theory unique. The first concerns the kind of belief being assessed. Seligman and Rotter are concerned with beliefs about contingencies in the world (e.g., "Is that outcome contingent on my behavior?"), which Bandura calls an *outcome expectation*. But Bandura points out that it is possible to believe that an outcome is dependent on one's behavior yet not believe that one can produce the required behavior. Bandura therefore focuses instead on beliefs about the self and the self's abilities. He shifts the psychological focus to what he calls an *efficacy expectation*, which is the belief that one can successfully execute the behavior required to produce a particular outcome.

The second difference concerns the domain specificity of the beliefs in question. Bandura does not deny that people may have generalized outcome expectancies (i.e., that the world is or is

not controllable), but he insists that generalized expectations are of little use in predicting specific behaviors. Efficacy expectations, which are assessed within specific domains, are better predictors of behavior. Efficacy beliefs are multidimensional; even within a broad domain such as school or child rearing, most people think they are good at some tasks and not good at others. Bandura's (1997) "sociocognitive" approach therefore "provides profiles of efficacy beliefs across diverse domains of functioning rather than evading the distinctive patterning of human belief systems by using general measures" (p. 52).

In a typical self-efficacy assessment, participants are asked to rate how confident they are that they can perform each of a series of behaviors, graded for difficulty (e.g., "I could look at a spider"; "I could let a spider walk up my arm"). An important finding from Bandura's research is that people's ratings of self-efficacy in challenging situations are better predictors of their subsequent behavior than are their past records of success and failure (Bandura, 1977). It is rare in psychological research that anything outpredicts past performance.

But do self-efficacy beliefs cause effective performance, or do they simply reflect people's ability to predict their own behavior? Bandura and his colleagues have provided evidence that direct manipulations of self-efficacy beliefs affect performance. Weinberg, Gould, and Jackson (1979), for example, gave participants bogus feedback about performance in a competition of muscular strength, thereby raising or lowering their self-perceptions of physical efficacy. When tested on a different motor task requiring physical stamina, participants with artificially elevated efficacy beliefs displayed greater physical endurance. Even more important is the finding that the two groups reacted differently to failure in a subsequent competition. Participants whose self-efficacy beliefs had been raised in the first stage of the experiment responded to failure with even greater physical efforts, whereas those whose efficacy beliefs had been undermined turned in even weaker performances in the final stage. When faced with difficulties, people who doubt their abilities quickly give up, whereas people with a strong belief in their own efficacy will try even harder to rise to a new challenge (Bandura & Cervone, 1983).

Questioning the Cognitive Focus

This brief and selective review was designed to show how control served as one of the bridges that brought psychology to its current strongly cognitive focus. The field began with challenges to behaviorism and psychoanalysis, which had denied the importance of agency. White proposed that behaviorists and psychoanalysts should accept their own evidence for the existence of a motivation for competence. Rotter, Seligman, and Bandura continued the challenge to traditional learning theories, aided by the growing recognition of the importance of cognition and information processing in the 1960s and 1970s. By 1980, almost all researchers had adopted a cognitive perspective, focusing on people's beliefs and attributions about control, causality, and efficacy. Furthermore, several theorists had pointed out difficulties with the motivational formulation of White, such as that people do not always want control for control's sake, particularly when they believe that they lack the information to make a good decision or when they believe that having control will not help them achieve their goals (Bandura, 1989; Rodin, Rennert, & Solomon, 1980).

The recognition of the power of conscious belief was undoubtedly an improvement over earlier dogmatic denials of the role of consciousness. But was anything lost in the transition? Should research on control and efficacy limit itself to the study of people's individual beliefs? In her review of more than 100 control constructs, Skinner (1996) justified the focus on "subjective" control constructs by quoting Langer (1979, p. 306): "Virtually all researchers studying the importance of control will agree that the effects of objectively losing or gaining control will only have psychological significance if the person recognizes (accurately or inaccurately) the gain or loss."

Yet, we have found that not all researchers agree on the primacy of conscious recognition and belief. Animal researchers generally believe that conscious recognition is not necessary. Psychoanalysts do too, and they are joined by some social and cognitive psychologists interested in automatic or unconscious control processes (Wegner & Bargh, 1998). And sociologists since Durkheim appear to be perpetually frustrated by psychologists' difficulty in seeing emergent social structures and forces, about

which individuals are often unaware. Consciously accessible beliefs about control and efficacy are clearly very important, but there is more to the story. To see what more there is, we now turn to the sociological perspective on control.

Control as a Mind–Society Bridge

Sociological theories have traditionally posited the importance of supra-individual forces and structures in explaining human behavior (e.g., Durkheim, 1897/1951). If one wants to know why and how control is good for people, one must go beyond the study of individuals and their beliefs. One must also investigate a variety of structural properties of social systems about which individuals may even be aware. However, even though one level of explanation cannot be reduced to the other, the two can be joined and articulated into a broader and more powerful theory. Many sociologists strive for such "micro-macro integration" (recently described as "consilience" by Wilson, 1998), and a number of bridges have been built between social structures and individual outcomes, via control-related constructs. We explore four of those bridges here (for major reviews of self-efficacy within sociology, see Gecas, 1989; Gecas & Schwalbe, 1983; and Mirowsky & Ross, 1989).

Alienation and Anomie

Alienation is one of the oldest concepts in sociology, rooted in the writings of Marx (1844/1963). In Marx's view of human nature, the self is created by participation in "praxis," or habitual practices, particularly work activity. Efficacious and self-directed work activity creates efficacious and self-directed individuals. A large part of Marx's critique of capitalism was that industrial production methods take control away from the individual and turn the individual into a part of the larger machine. The psychological effect of such work environments is *alienation*, a state marked by feelings of powerlessness and misery, in which work is dull and unfulfilling. Marx thought there was a natural human need to create and produce and that this need goes unmet when producers are separated from products and when labor is performed only to obtain money.

Alienation can be a state of an individual or it can be seen as an emergent property of social systems. Empirical studies of alienation have

concentrated on its manifestation in individuals, where alienation has been conceptualized in six different ways, according to Seeman (1959, 1975): (a) *powerlessness* (the sense of low control vs. mastery over events), (b) *meaninglessness* (the sense of incomprehensibility vs. understanding of personal and social affairs), (c) *normlessness* (high expectancies for socially unapproved means vs. conventional means for the achievement of given goals [i.e., deviance pays]), (d) *cultural estrangement* (the individual's rejection of commonly held values in the society [or subsector] vs. commitment to the going group standards), (e) *self-estrangement* (the individual's engagement in activities that are not intrinsically rewarding vs. involvement in a task or activity for its own sake), and (f) *social isolation* (the sense of exclusion or rejection vs. social acceptance).

The first form of alienation as powerlessness is the most direct descendent of Marx's writings, and it was incorporated into Rotter's thinking about locus of control. The third form of alienation as normlessness—and, to some extent, the second form as meaninglessness—covers what Durkheim called *anomie*, a state of deregulation characteristic of modern societies in which traditional norms and standards have been undermined without being replaced by new ones. Durkheim believed that social constraint is healthy, because it gives people standards and structure within which their ambitions can be met. When constraints are relaxed and norms are unclear, as during times of rapid social change, human ambitions and demands expand like a gas released into a vacuum. Nobody can be satisfied or happy, because nobody can achieve his or her ambitions. In Durkheim's sociological perspective, individual happiness requires social-structural supports: the existence of clear social norms and a widely accepted and respected social order.

Reading Durkheim while thinking about control and efficacy leads to the following speculation: Normlessness and chaos breed misery and suicide in part because they are structural impediments to the satisfaction of effectance motivation. Thoits (1983) has argued along similar lines that when people are not well integrated into cohesive groups, they are less likely to have a sense of certainty, purpose, and meaning in life. Thorlindsson and Bjarnason (1998) recently found empirical support for this

Durkheimian position on the micro level, demonstrating that family integration counteracted anomie and reduced suicidal ideation in a large sample of Icelandic youth.

Work, Class, and Control

Marx and Durkheim are sometimes criticized for denying the importance of human agency and for stressing the determinism of social forces. But they both at least acknowledged in human nature a need for some sort of control, competence, or achievement. They are also in accord that social structures such as social class interact with these needs. Durkheim (1897/1951), for example, explained why an internal locus of control, or sense of mastery, should correlate with socioeconomic status (SES):

Wealth, . . . by the power it bestows, deceives us into believing that we depend on ourselves only. Reducing the resistance we encounter from objects, it suggests the possibility of unlimited success against them. The less limited one feels, the more intolerable all limitation appears. (p. 254)

Marx wrote even more extensively about the psychological effects of social class. Alienation was supposed to result from the disempowering conditions of labor, yet labor conditions vary greatly by social class. Members of the dominant class retain power and personal control (e.g., through ownership of the means of production) and so should not become alienated in the course of their daily work. This is a verifiable hypothesis, and a number of studies have tested it.

The most comprehensive study of the psychological effects of work conditions was done by Melvin Kohn and his colleagues (collected in Kohn & Schooler, 1983). They conducted cross-sectional studies on a representative sample of 3,100 employed American men in 1964, one quarter of whom were interviewed again 10 years later to obtain longitudinal data. They measured SES as well as a variety of occupational conditions and psychological orientations, including five of the kinds of alienation conceptualized by Seeman (1959). They found that three related occupational conditions were the key to understanding a great variety of psychological outcomes, including alienation: (a) closeness of supervision in the workplace, (b) substantive complexity of work, and (c) routinization of work. They combined these

three conditions into a higher order construct labeled *occupational self-direction*. Men who were closely supervised in jobs with low complexity and high routinization showed the highest degree of three kinds of alienation: powerlessness, normlessness, and self-estrangement.

One part of the Marxist thesis was therefore supported: Conditions of work, particularly a lack of control and a lack of challenge, are related to alienation. However, another part of the thesis was not supported. Kohn and Schooler distinguished between two kinds of control: control over the product of one's labor (operationalized as either owning one's own business or having high rank in a supervisory hierarchy) and control over the process of one's labor (i.e., occupational self-direction). In Marx's portrayal of early industrial capitalism, these two kinds of control were inseparable. However, in Kohn and Schooler's data they were quite separable, and, when examined separately, it was control over process that mattered. Ownership of the means of production and high rank in a supervisory hierarchy bore only a weak negative relationship to alienation, a relationship that was mediated by occupational self-direction. In other words, supervisors feel less alienated than lower level employees, but that is because, on average, supervisors enjoy greater occupational self-direction (Mirowsky & Ross, 1989, obtained similar findings).

The implication of this finding is that wage labor and low rank in a capitalist system need not lead to alienation, if workers can be given some degree of occupational self-direction. In fact, Kohn and Schooler argued that it is primarily through its correlation with occupational self-direction that social class exerts its effects on personality. They concluded that

occupational self-direction has the most potent and most widespread psychological effects of all the occupational conditions we have examined. In terms of these effects, the central fact of occupational life today is not ownership of the means of production, nor is it status, income, or interpersonal relationships on the job. Instead, it is the opportunity to use initiative, thought, and independent judgment in one's work—to direct one's own occupational activities. (Kohn & Schooler, 1983, p. 84)

Thus, control-related variables again provide the bridge from social-structural properties (class, status, and working conditions) to individual outcomes. Control appears to be part of the

explanation for the damaging effects of low social class, whether the outcome variable is alienation, as just described, or physical health, as in recent findings that health and SES are correlated at all levels of SES (Adler et al., 1994; Marmot et al., 1991). The health-damaging effects of low status in a hierarchy have even been extended into the animal kingdom by Sapolsky (1992), who found that low-ranking male baboons have higher basal cortisol levels but that the relationship between rank and cortisol level fluctuates with the stability of the social order.

Social Capital

A more recent construct for the sociological study of control and efficacy comes from Coleman's (1988, 1990) work on *social capital*. Coleman starts with the motivational theory of rational action, borrowed from economics, in which individual agents strive to maximize utility. He then gives these rational actors a strongly social nature, acknowledging that people are governed by norms, rules, and obligations. Next, he asks what these social-rational agents need to maximize utility. He lists three kinds of capital about which most economists would agree: (a) financial capital (money), (b) physical capital (e.g., equipment, tools, and clothing), and (c) human capital (education, knowledge, and training). Coleman then proposes a fourth kind of capital that economists have generally missed: social capital, which inheres not in any person but in the structure of relations among actors. There are at least three kinds of social capital, but all of them have the following two properties: "They all consist of some aspect of social structures, and they facilitate certain actions of actors—whether persons or corporate actors—within the structure" (Coleman, 1988, p. S98).

The most important form of social capital consists of a dense network of obligations, expectations, and trustworthiness. Coleman gives the example of the wholesale diamond market in New York, where the high degree of trust and mutual obligation among the members allows them to make transactions without fear of theft or deceit by one another and therefore without expensive monitoring and litigation procedures. If an alternate wholesale market were to be founded in which members lacked this interper-

sonal trust, its costs would be higher and it would fail. Strong social ties and interpersonal trust are a form of social capital, a kind of infrastructure that facilitates the goals of the merchants and the efficiency of the market.

The second form of social capital consists of information channels. A system in which people can rely on friends or colleagues to pass on to them essential information will function more effectively than a system in which each individual must gather all of her or his own information from primary sources. The third form of social capital is norms and effective sanctions. When widely held norms support the goals of a social system, the system will work more effectively.

The concept of social capital has proven extremely useful for the study of complex social systems. Social capital is particularly important for the study of control and efficacy because it provides a way of thinking about efficacious systems, as well as about the mechanisms through which efficacious systems create efficacious individuals. A system with a high level of social capital will, *ceteris paribus*, outperform a system with lower social capital, and it will do so in part because it makes available to its members a set of resources that enables them to reach their individual and collective goals. More broadly, it can be said that a fully capitalized system, including sufficient levels of all four forms of capital, provides individuals with greater affordances, or opportunity structures, than a system that is undercapitalized.

Collective Efficacy

Bandura's theory of self-efficacy was developed for individuals, but he has extended it to the operation of groups as well. Bandura (1997, p. 477) defined collective efficacy as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments." When the members of a group work independently toward a common goal, such as on a gymnastics team, the collective efficacy of the group is essentially the sum of the efficacies of the individual members. But when the group is highly interdependent, as on a basketball team or in many organizational settings, perceived collective self-efficacy becomes an emergent group-level attribute that is more than the sum

of its individual parts. As with individual self-efficacy, collective efficacy is multidimensional, and it grows primarily out of prior mastery and success experiences. Also as with individual self-efficacy, collective efficacy can be experimentally enhanced with the same beneficial effects on outcomes (Prussia & Kinicki, 1996).

Collective efficacy is particularly useful for understanding political and social change. Many groups around the world are discriminated against or excluded from power and prosperity, but it is primarily those that have a high collective level of political efficacy that undertake vigorous and sustained action toward political change (Bandura, 1997, chap. 11). Political efficacy, in turn, is partially a product of structural factors such as the material and social capital of the group and the openness or responsiveness of the political system to that group (Zimmerman & Rappaport, 1988). But political efficacy, and other forms of collective efficacy, can then reshape those structural factors in ways that enhance the group's subsequent political efficacy. Such a dramatic reciprocal change clearly happened in the United States with African American political efficacy in the 1960s.

In summary, sociological theories view individual beliefs within the broader context of complex social systems. Societies and institutions with high social capital and low anomie, in which workers are given a high level of occupational self-direction, will produce engaged individuals with a healthy sense of control and a strong sense of collective efficacy. Efficacious individuals and groups will simultaneously work to change the systems within which they live. Control thus provides a "mind-society" bridge, revealing how social-structural factors affect minds, and vice versa. The sociological perspective is fully compatible with the individual-centered view prevalent in psychology, but it suggests very different avenues for intervention. Whereas psychologists generally favor education and therapy aimed at changing individual beliefs, sociologists point to the alternate route of changing system-level variables (e.g., changing tax laws or zoning policies to strengthen families and neighborhoods, or improving the responsiveness of authorities and institutions to encourage more active participation by individuals and groups).

Control as a Mind–Body Bridge

In addition to bridging the psychological and sociological levels of analysis, control is also well suited as a bridge between the psychological and physiological levels of analysis. Control and efficacy can help explain the mind–body mechanisms by which social events can cause or prevent disease. Several of these bridges are outlined in this section (for full reviews, see Adler & Mathews, 1994; Cohen, 1990; O’Leary, 1985; Peterson, Maier, & Seligman, 1993; Rodin, 1986a, 1986b; Taylor, Repetti, & Seeman, 1997).

Control and Stress

Control beliefs modulate the physiological and psychological impact of various stress-provoking stimuli, even when the objective intensity of the stressor is unchanged. In a classic study conducted by Glass and Singer (1972), two groups of participants were exposed to loud bursts of noise. Participants in one group were told they could terminate the noise by pressing a button, but they were asked not to press the button unless it was absolutely necessary. None of these participants pressed the button, yet the belief that they had some form of control made the noise less aversive and less likely to induce helplessness on subsequent tasks requiring persistence. An enormous number of laboratory experiments and field studies confirm the tight relationship between control and stress. For example, Baum and his associates have found that perceived loss of control is one of the most important mediators of reactions to disasters such as flooding, exposure to toxic waste, and the near meltdown of the Three Mile Island nuclear power plant (Baum, Cohen, & Hall, 1993; Baum, Fleming, Israel, & O’Keeffe, 1992).

Control is related in complex ways to coping, but under most circumstances having the ability and resources to engage in problem-focused coping reduces the physiological and psychological impact of stressors and daily hassles (Folkman, 1984). Social class is therefore correlated with a sense of control and inversely correlated with a sense of constraint (House et al., 1994; Lachman & Weaver, 1998), and this relationship appears to be an important contributor to the SES–health gradient. People at any

level of SES are healthier than those below them (Marmot et al., 1991), and this correlation appears to be due in part to psychosocial variables including control (Adler et al., 1994; House et al., 1994; Taylor et al., 1997). Even among individuals of low SES, those with a strong sense of perceived control show levels of health characteristic of a higher SES (Lachman & Weaver, 1998).

Many studies have documented the physiological effects of control directly, particularly on the cardiovascular and immune systems (Bandura, 1991, 1997). Lack of control has been associated with elevated catecholamine levels (e.g., adrenaline) in animal and human studies (Frankenhaeuser, 1983; Weiss, Stone, & Harrell, 1970). High levels of catecholamine are in turn associated with increased blood pressure and heart rate, elevation of blood lipids, and ventricular arrhythmia. There also appears to be a strong relation between control and levels of circulating corticosteroids (e.g., cortisol) in both animals and humans (Breier et al., 1987; Meier, Ryan, Barksdale, & Kalin, 1988). Corticosteroids regulate the metabolism of cholesterol and other lipids involved in heart disease and play a role in regulating electrolyte balance and blood pressure. These endocrine effects may account for much of the reported relation between heart disease and control-related variables (Krantz, Glass, Contrada, & Miller, 1981).

Animal and human studies have also shown a direct effect of uncontrollable stress on the immune system. Laudenslager, Ryan, Drugan, Hyson, and Maier (1983) gave rats either escapable shock or an identical amount of inescapable shock and found that the rats that lacked control showed suppressed lymphocyte proliferation and mitogen response. Seligman and Visintainer (1985) injected live tumor cells into rats that received escapable shock, inescapable shock, or no shock and found that rats exposed to inescapable shock were more likely to develop tumors and die than were rats in the other two conditions. In one of the few studies to use a direct manipulation of controllability to study human immune response, Sieber et al. (1992) found that exposure to controllable loud noise produced no measurable effects on immune response, whereas yoked participants who were exposed to an equal amount of uncontrollable noise showed a decrease in cytotoxicity of natural killer cells that was measurable up to

72 hr later. Sieber et al. also found that the effect of uncontrollability on natural killer cell toxicity was greatest for participants who scored high on a desire for control scale (Burger & Cooper, 1979), consistent with the idea that these participants should be most strongly affected by the absence of control.

However, the relationship between control and stress is complex (Averill, 1973; Burger, 1989; Folkman, 1984; Thompson, Cheek, & Graham, 1988). Rodin et al. (1980) discussed cases in which increasing control can be stress inducing, such as giving a patient the responsibility to make a medical decision that she or he does not feel qualified to make. Wright (1998) has demonstrated that a high sense of efficacy often leads to greater cardiovascular reactivity in response to challenges, because people with low self-efficacy, who believe a task is impossible, may simply not get aroused to meet the challenge. Yet, despite these important reversals, it is generally the case that personal control reduces the stressfulness of environmental threats and challenges.

Control and Positive Affect

Control clearly serves a stress-buffering function, dampening negative affective and endocrine responses to threats and challenges. But Cohen (1990) and others think that control also has direct positive health consequences, in part through its ability to produce positive affect. Davidson may have identified the brain circuits involved with his discovery of two distinct motivational systems (Davidson, 1994; Davidson, Ekman, Saron, Senulis, & Friesen, 1990; Sutton & Davidson, 1997). The *approach system* facilitates appetitive behavior and generates certain types of positive affect that are approach related, such as enthusiasm and pride. The approach system involves limbic and cortical structures that appear to have a convergence zone in the left prefrontal cortex. A separate *withdrawal system* appears to have a convergence zone in the right prefrontal cortex, functioning to facilitate withdrawal from sources of aversive stimulation and to generate negative affect, including fear.

The approach system generates two distinct forms of positive affect. The first is labeled *pre-goal-attainment positive affect*, which Davidson (personal communication, April 1995) has

described as “the positive affect that arises as you are progressively moving towards a desired goal.” The second kind of positive affect is called *post-goal-attainment positive affect*, which according to Davidson, arises once one has achieved something one wants. This latter type of affect “may be phenomenologically experienced as contentment and is expected to occur when the prefrontal cortex goes off-line after a desired goal has been achieved” (Davidson, 1994, p. 743).

In other words, Davidson has identified a reward system that might be the neural basis of effectance motivation. It is a reward system triggered not by success itself but by progress in goal management and successive increases in mastery. The activation of this goal-pursuing system leads to increased engagement with the environment, including positive affect, pleasure from interaction, and increased persistence in the face of obstacles (Davidson, 1994). Davidson has found that activation of the approach system dampens activation of the amygdala, which is a principal trigger of the hypothalamic–pituitary–adrenal pathway, by which threat appraisals in the brain trigger rapid cortisol release by the adrenal glands. This finding suggests a possible route by which the approach system may have health-protective effects. People who have as a trait a generally higher activation level in their left frontal cortices (approach) rather than their right cortices (withdrawal) have been found to have greater immune competence, both at rest and in response to stressors (Kang et al., 1991). Such findings may partially explain why approach-oriented optimists stay healthier and live longer than more fearful pessimists (Peterson et al., 1993).

Control and Health Behavior

Individuals with higher levels of perceived control and efficacy in health-related domains take greater responsibility for meeting their health needs, including seeking out information and complying with medical regimens involving lifestyle changes (DiMatteo, 1994; O’Leary, 1985; Seeman & Seeman, 1983). When told to quit smoking, for example, people are less likely to succeed if they believe either that they will not be able to quit (i.e., low self-efficacy) or that quitting will not affect their health outcome (i.e.,

external locus of control for health). People who have a strong belief in their own self-regulatory efficacy, in contrast, are more likely to undertake a program of personal habit change, more likely to maintain the new habit over time, and more resistant to relapse temptations (Carey & Carey, 1993; DiClemente, Fairhurst, & Piotrowski, 1995; see Bandura, 1997, chap. 7, for a review).

But there is a more subtle component to the control-behavior connection: Control increases energy and vigor, perhaps via the mechanisms described by Davidson (1994). Langer and Rodin's (1976) nursing home intervention, for example, produced its largest effect on the vigor of the residents. Conversely, Seligman (1975) described the passivity and lethargy that are hallmarks of learned helplessness. If feelings of control are often energizing, then they may make any behavioral task easier, thereby encouraging problem-focused coping strategies and proactive health-promoting behavior.

In summary, control and efficacy provide bridges from the psychological world of meanings and beliefs to the physiological world of stress hormones and immune suppression. When combined with bridges built "up" to the sociological level, the result is a set of interdisciplinary links by which one can begin to tell a complete scientific story (Kahn, 1993; Wilson, 1998). One can explain how the loss of order and predictability in a society (e.g., modern Russia) might cause an increase in morbidity and mortality rates. To facilitate the interdisciplinary use of control and efficacy, we now present an organizing taxonomy.

A Taxonomy of Control Constructs

This report has covered three perspectives on control: the motivational perspective from which the field began, the cognitive perspective to which it moved, and the systemic perspective taken by sociologists. Each of these three perspectives looks at a different kind of causal explanation. The motivational perspective looks at intrinsic motivations that drive behavior, such as effectance. The cognitive perspective looks at belief structures that mediate action, such as self-efficacy beliefs. The systemic perspective looks at structural properties of social systems that foster or inhibit individual or group competence and success, such as social capital or social disorganization.

By labeling these approaches as "perspec-

tives," we mean to stress that each one can be used to look at a social or developmental issue, and that each perspective will yield its own set of insights and prescriptions for intervention. No perspective can be reduced to the terms of the others, and no perspective contradicts the validity of the others.

Within each perspective, there are multiple constructs that can be used in theory construction. We describe six constructs that we think are useful and versatile, but this list is intended to be suggestive, not exhaustive (for an exhaustive list of control belief constructs, see Skinner, 1996). The six constructs should be thought of as a "toolbox" of control constructs that work well together. For each construct, we discuss measurement issues and suggest tasks for which the construct is particularly well suited.

The Motivational Perspective

The importance of control was first discovered in research with dogs, monkeys, and young children, including prelinguistic infants (reviewed in White, 1959). A great strength of the motivational perspective is that it works for creatures lacking language and the complex belief structures that language facilitates. The motivational perspective posits an innate or intrinsic need to achieve a particular kind of relationship with the environment. This relationship is, at a minimum, one of control or causality, and in its more elaborate forms it is labeled as competence, mastery, or achievement.

Later motivation theorists focused on human beings, but their theories work as well for infants as for adults. Deci and Ryan (1985) posited an innate need for self-determination. Brim (1992) posited a universal human drive for growth and mastery, which makes people actively seek out challenges. Heckhausen and Schulz (1995) posited a universal human desire to exert primary control over the environment, which is defined as the production of "behavior-event contingencies." Common to these theorists is a notion of *intrinsic reward*. Mastery, competence, and control are (usually¹) pleasurable, and people will take on challenges, master

¹ The existence of cases in which mastery, competence, or control is not pleasurable does not argue against theories of intrinsic motivation any more than the existence of cases in which food is not pleasurable argues against the existence of an intrinsic motivation to eat.

new skills, or make things happen because it feels good to do so, because people are built to derive pleasure from approaching their goals (Davidson, 1994; White, 1959).

The motivational perspective is an optimistic perspective on human nature. It assumes that "if social contexts can manage to set up opportunities, people will actively strive to become more competent" (Skinner, 1995, p. 16). The motivational perspective lends itself to metaphors for growth. James Connell (personal communication, May 19, 1995) speaks of "thriving" versus "surviving" in school and sees the difference as due in part to whether the school environment provides the right "nutrients" for psychological needs, including competence.

A variety of motivational constructs have been posited. Here we select just two for elaboration.

Construct 1: Effectance Motivation

Description. As described by White (1959) and Harter (1978), effectance is an intrinsic motivation or striving for competence or mastery. The satisfaction of effectance leads to a pleasurable feeling of efficacy. Several researchers have proposed that White's effectance can be divided for analytical purposes into two distinct needs: a need for competence or mastery and a need for autonomy or self-determination (Deci, 1995; Deci & Ryan, 1985; Skinner & Connell, 1986). We focus in this report on effectance as a need for competence, because this motivation is more closely related to subsequent constructs and because it appears to be more culturally universal than the need for autonomy, which may be a particularly Western need (Markus & Kitayama, 1991; Shweder, Balle-Jensen, & Goldstein, 1995).

Measurement. It is not clear at present whether there are global, stable differences between individuals in their levels of effectance motivation. On the one hand, effectance can be seen as a basic fact about people, as something that "comes with the animal" (O. G. Brim, personal communication, March 20, 1995). On the other hand, Harter's (1978) analysis suggests that effectance might be strengthened or weakened in long-lasting ways by childhood experiences of mastery and failure and of support and discouragement. Davidson's (1994) suggestion

of plasticity in the neural development of approach and withdrawal systems also indicates the possibility of individual differences. And there have been several scales and behavioral tasks designed to measure individual differences in effectance motivation in children (Harter & Zigler, 1974; Pearlman, 1984). However, these scales have not been widely used, and there does not appear to be any well-validated method at present for measuring individual differences in generalized effectance motivation.

Uses. Until it is determined whether or not effectance varies in a traitlike way across individuals, this construct is best used as a general assumption about human needs and desires (i.e., humans need food, water, competence, and a few other things to thrive). It is especially useful for thinking about the "good life," or the conditions of human satisfaction. As Brim (1992) demonstrated, happiness comes not from material success but from living life at a level of "just manageable difficulty" in which effectance is repeatedly engaged by properly geared challenges. Effectance is also useful for thinking about life span transitions, which always involve new sets of challenges and performance expectations. In thinking about any transition, one can ask the following questions: Are opportunities for competence expanding or shrinking? Are opportunities closely matched to abilities and resources? Are challenges overwhelming or insufficient? The match between effectance needs and environmental affordances is often the key to understanding successful development (Eccles, Midgley, Wigfield, & Buchanan, 1993; Elder, 1998).

Construct 2: Engagement

Description. Engagement is a quality of intrinsically motivated behavior in a particular context. It is difficult to measure motivations such as effectance directly, yet a state of engagement can be inferred from a person's behavior (e.g., working persistently or doing more than the minimum), emotion (e.g., self-reports and others' ratings of interest vs. boredom), and task orientation (e.g., confidence and willingness to take risks with more difficult challenges; J. P. Connell, personal communication, May 19, 1995). Engagement is similar to Csikszentmihalyi's (1991) notion of *flow*. En-

agement is a visible sign of effectance motivation at work (although engagement can result from the operation of other intrinsic motivations as well; see Connell, 1990).

Measurement. Engagement should not be thought of as a trait or as a property of persons divorced from contexts. Engagement refers to a way of being in a given context, and it can be assessed only in a given context. The Rochester Human Motivation Research Group has developed a series of instruments for measuring engagement in the classroom context known as the Research Assessment Package for Schools (RAPS; Wellborn & Connell, 1987). The RAPS asks parents and teachers to rate various aspects of a student's behavior and apparent emotions, and it asks students to report their own behavior, emotions, and thoughts.

Uses. Engagement has been demonstrated to be a critical mediating variable in a variety of performance contexts (Connell, Spencer, & Aber, 1994). People who work hard at a task they are committed to and interested in achieve better results than people who are disaffected or unengaged. Engagement and disaffection can therefore enrich process models whenever the causes and correlates of high performance are being studied. (Note that engagement is not confounded with outcome measures, such as grades.) Engagement is particularly useful as a mediating variable in intervention studies, because one does not have to wait until grades are assigned at the end of the semester (for example) to determine whether the intervention is having an effect. If the intervention increases student engagement in academic activities, it is likely to be effective.

The Cognitive Perspective

The motivational perspective makes it easy to see the continuity between humans and animals. Indeed, White (1959) speculated that there may be an ancient evolved motivation for effective interaction with the environment. Yet, human beings have also evolved a variety of cognitive abilities that intervene between motivation and behavior, creating a more elaborate set of mechanisms for the operation of control and efficacy. The cognitive perspective looks at the ways in which beliefs about control, contingencies, and capacities affect human behavior, mood, and cognition.

Many distinctions among beliefs have been proposed. The highest-level distinction, made by many authors, is between beliefs about the self (e.g., Bandura's, 1977, self-efficacy beliefs, Gurin and Brim's, 1984, personal efficacy judgments, and Skinner's, 1995, capacity beliefs) and beliefs about contingencies in the external world (e.g., Rotter's locus of control, Seligman's learned helplessness, Bandura's outcome expectancies, Gurin and Brim's system-responsiveness judgments, and Skinner's strategy and control beliefs).

A second distinction is commonly made between domain-specific beliefs and generalized beliefs. These two distinctions can be crossed to create a 2 × 2 table (see Table 1). Most of the research on control and efficacy falls into two of the four cells.

Construct 3: Self-Efficacy Beliefs

Description. Bandura (1997, p. 3) offered a clear definition: "Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments." Self-efficacy beliefs are the product of learning (direct or vicarious) within particular domains of experience. Self-efficacy beliefs strongly influence the effort a person will expend in meeting a challenge, and they are among the best predictors of success in many contexts. Self-efficacy is close to what Skinner (1996) described as the "prototypical" control construct, the one most psychologists think of when thinking about control.

Measurement. Self-efficacy beliefs are assessed by a questionnaire or interview in which participants are asked to rate their ability to

Table 1
Four Types of Belief

Specificity	Beliefs about self-capacities	Beliefs about environmental contingencies
Domain specific	Self-efficacy beliefs (Bandura)	Domain-specific locus of control
Generalized	Grandiosity? Self-esteem?	Generalized control beliefs (Rotter and Seligman)

perform a variety of well-specified tasks ranging in difficulty. Well-crafted and well-validated self-efficacy instruments are widely available in the published work of Bandura (1997) and his colleagues, and they were recently used in large-scale studies of schools, families, and neighborhoods by Elliott et al. (in press); Furstenberg, Cook, Eccles, Elder, and Sameroff (1998); and King and Elder (1998).

Uses. Self-efficacy theory was designed to explain, predict, and improve performance in specific domains. It is exceptionally well suited to performance domains in which a person perceives a challenge and is motivated to succeed, yet is not certain about her or his abilities (e.g., overcoming phobias and drug addictions, sticking to diets or medical regimens, or doing well in school or sports). Self-efficacy measures are also useful in studies that measure changes over time in multiple life domains (e.g., Gurin & Brim, 1984; Lachman, 1986; McAvay, Seeman, & Rodin, 1996). Because self-efficacy beliefs influence future behavior, such beliefs can be an effective entry point for interventions aimed at specific problems or behaviors (Rodin, 1989).

Construct 4: Generalized Control Beliefs

Description. Control beliefs vary by domain (Bandura, 1997; Skinner, 1995). Nonetheless, some people are more likely than others to become helpless, to perceive an external locus of control, or to make external causal attributions across multiple domains (Lefcourt, 1981; Peterson et al., 1993). Theories of control may therefore be analogous to theories of intelligence that include a general factor (*g*), to which specific factors (*S*) are added. Seligman and Rotter have proven the existence and importance of a general factor, which can be reliably measured.

Generalized control beliefs can therefore be thought of as a personality trait, or as a stable "attributional style." Some people tend toward internality, and others tend toward externality. Alternatively, some people have a "mastery-oriented" response style, whereas others have a "helpless" response style (Diener & Dweck, 1978; Dweck & Leggett, 1988). This trait makes some contribution to behavior and outcomes across a broad spectrum of domains, and its influence is likely to be strongest in domains in

which a person has the least prior experience (i.e., those in which domain-specific beliefs have not yet been formed). It is important to note, however, that both Seligman and Rotter are learning theorists. They both view this "trait" as the product of experience rather than as an inborn cognitive temperament. People who are exposed to frequent noncontingency and uncontrollability learn to expect noncontingency and uncontrollability, and these expectations generalize beyond the domains in which they were formed.

Measurement. This is the only one of the six constructs that can be thought of as a stable personality trait, and it is therefore relatively easy to measure. General scales can be used in many cases without customization. Seligman and Peterson's Attributional Style Questionnaire (Peterson et al., 1982) and Rotter's (1966) I-E Locus of Control Scale and its variants are the most widely used scales. Pearlin's Mastery Scale (Pearlin & Schooler, 1978) is a short and simple scale that is also widely used. Seligman and Peterson's approach to measurement is the richest, in that it assesses three dimensions of attribution and differentiates between attributions about positive and negative events. However, the Attributional Style Questionnaire incorporates scenarios and questions that are most meaningful for middle-class young adults, and it may need to be modified for use in other populations.

Uses. Generalized control beliefs are less useful than specific efficacy beliefs in predicting specific behaviors (e.g., who will quit smoking). But they are useful for predicting successful adaptation in broad domains of activity, where it is generally found that people with an optimistic explanatory style or an internal locus of control do better than others (Scheier & Carver, 1985; Seligman, 1991). There are, however, a number of exceptions to this rule, and there appear to be situations in which externality and pessimism are adaptive, such as, perhaps, law school (Satterfield, Monahan, & Seligman, 1997). Generalized control beliefs are particularly useful in new situations and contexts, where domain-specific self-knowledge may not be available. Also, because of the tight link between helplessness and depression (Seligman, 1975), generalized control beliefs are important in studies concerned with mental health.

The Systemic Perspective

Motivations and beliefs do not arise in a social vacuum, and researchers using the cognitive and motivational perspectives often try to spell out the relationships between the individual and broader social systems, such as schools, neighborhoods, workplaces, and families (see especially the work of Skinner, 1995, and Connell, 1990, and the European tradition of action theory [e.g., Frese & Sabini, 1985]). These systems can be thought about in two ways. First, one can focus on the individuals within a system and ask how social-structural properties, as independent variables, support or inhibit individual success and failure as dependent variables. This view gives us our first systemic construct, *systemic supportiveness*. Alternatively, we can leave the individual level entirely and take the social system as the unit of analysis. We can think about efficacy and control as properties of healthy social systems, and we can ask what factors lead to *systemic efficacy* as a dependent variable.

Construct 5: Systemic Supportiveness

Description. A supportive system is a system that provides the affordances that an individual needs to take on and master new challenges (i.e., resources, structures, and opportunities that match the needs and abilities of the individual). A supportive school will have a different set of features than a supportive family, but in general a supportive system may be characterized by the following features: highly predictable contingencies, clear expectations and norms for performance and success, clear feedback about performance, encouragement for mastery attempts, high social capital (in the form of dense social networks that can be tapped for information or resources), and sufficient physical capital (see Coleman, 1988; Furstenberg et al., 1998; Gurin & Brim, 1984; Sampson, 1993; Skinner, 1995). A supportive system can be described in motivational terms as a system that leads to high engagement and allows individuals to satisfy their effectance motivation. A supportive system can be described in cognitive terms as a system that bolsters self-efficacy beliefs by providing mastery opportunities and that creates internal control beliefs by

making people's outcomes consistently dependent on their own actions.

Measurement. Assessment methods can involve a variety of objective and self-report measures, aimed either at assessing the person-environment fit or at describing relevant features of an environment. Skinner and Connell include measures of "perceived structure" and other system-level variables in their school assessment instruments. Rudolph Moos and his associates (Moos, 1987, 1991; Moos & Lemke, 1992; Timko & Moos, 1989) have developed a variety of social climate questionnaires about work, family, school, and inpatient environments that pay close attention to the ways in which environments support or discourage control and autonomy. And a variety of sociological scales have been designed to measure alienation and anomie (Seeman, 1991).

Uses. Any study of human performance, development, satisfaction, or health should include measures of systemic supportiveness. Many psychologists are interested in person-environment interactions, and systemic supportiveness is another name for that interaction, viewed from the perspective of control and efficacy. Systemic supportiveness is particularly useful for understanding aggregate differences across demographic groups (e.g., ethnic communities and social classes) or institutions (e.g., why students at one school are doing better than students at another). It is also useful for designing interventions to make systems more supportive, which in many cases will be more practical and cost-effective than trying to change individual behavior directly through education or therapy.

Construct 6: Systemic Efficacy

Description. In the long run, we would all be better off if our basic institutions and systems worked well. But what does it mean for a system or institution to work well? Much of the answer is likely to revolve around issues of quality and efficiency; for example, an efficacious school must turn out well-educated children at a reasonable price per student. But we may be able to borrow some additional ideas from the study of control and efficacy at the individual level. For example, systemic efficacy may grow out of a good fit between a system and its broader social, legal, or economic context. Or

perhaps efficacious and inefficacious systems can be distinguished by their ability to respond to challenge and failure. Ira Harkavy (personal communication, March 14, 1995) pointed out the importance of linking systems (e.g., school systems and health systems) so that they work together to meet people's needs and their own. For now we simply want to stress the importance of thinking at the systemic level. Society is not just a collection of individuals. Schools, businesses, neighborhoods, and government agencies continue on as individuals cycle through them, and the efficacy of a system is not just the sum of the efficacy beliefs of the people passing through.

Measurement. Measurement might focus on the quantity and quality of a system's output, such as the academic achievement of a school's students or the sales growth and customer satisfaction ratings of a business. The costs of producing such outputs should be analyzed relative to comparable systems. Measurement could also look for signs of problems and inefficiencies within the system (e.g., employee dissatisfaction or the number of sick days taken or lawsuits filed by employees; R. Rosen, personal communication, February 16, 1995).

Uses. Systemic efficacy may be useful for thinking about school reform, corporate restructuring, or any other sort of institutional change. What resources and structural features does the system need to be efficacious? Systemic efficacy may be particularly useful for thinking about social policy. How can changes in the legal, economic, and social environment in which systems operate help schools, neighborhoods, workplaces, and families do their jobs well?

Conclusion

We believe that the three perspectives described here are highly compatible and that a kind of synergy results from using all three in tandem. People are motivated to attain competence and mastery, their *motivated* behavior is guided by their *beliefs* about self-efficacy and controllability, and the development of these motivations and beliefs depends critically on the fit between the individual and the multiple *social systems* he or she participates in, which can either support or inhibit efficacious, agentic behavior.

As psychologists take on increasingly large

real-world problems and lobby to have the next decade declared "the decade of behavior," it becomes increasingly important for us to work at multiple levels of analysis. In particular, public health problems often require working at the sociological, psychological, and biological levels simultaneously. Control and efficacy serve both as examples of how multiple levels can be bridged and as powerful tools for creating change in real-world systems. Combining the motivational, cognitive, and systemic perspectives on control can help us to meet these challenges and to make these changes.

References

- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49-74.
- Adler, N., Boyce, T., Chesney, M., Cohen, S., Folkman, S., Kahn, R., & Syme, S. L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist, 49*, 15-24.
- Adler, N., & Matthews, K. (1994). Health psychology: Why do some people get sick and some stay well? *Annual Review of Psychology, 45*, 229-259.
- Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological Bulletin, 80*, 286-303.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122-147.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*, 1175-1184.
- Bandura, A. (1991). Self-efficacy mechanism in physiological activation and health promoting behavior. In J. Madden (Ed.), *Neurobiology of learning, emotion, and affect* (pp. 229-269). New York: Raven Press.
- Bandura, A. (1995). *Self-efficacy in changing societies*. Cambridge, England: Cambridge University Press.
- Bandura, A. (1997). *Self efficacy: The exercise of control*. New York: Freeman.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*, 1017-1028.
- Baum, A., Cohen, L., & Hall, M. (1993). Control and intrusive memories as possible determinants of chronic stress. *Psychosomatic Medicine, 55*, 274-286.

- Baum, A., Fleming, I., Israel, A., & O'Keeffe, M. K. (1992). Symptoms of chronic stress following a natural disaster and discovery of a human made hazard. *Environment and Behavior*, *24*, 347-365.
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.
- Breier, A., Albus, M., Pickar, D., Zahn, T. P., Wolkowitz, O. M., & Paul, S. M. (1987). Controllable and uncontrollable stress in humans: Alterations in mood and neuroendocrine and psychophysiological function. *American Journal of Psychiatry*, *144*, 1419-1425.
- Brim, G. (1992). *Ambition*. New York: Basic Books.
- Burger, J. M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology*, *56*, 246-256.
- Burger, J. M., & Cooper, H. M. (1979). The desirability of control. *Motivation and Emotion*, *3*, 381-393.
- Butler, R. A. (1958). Exploratory and related behavior: A new trend in animal research. *Journal of Individual Psychology*, *14*, 111-120.
- Carey, K. B., & Carey, M. P. (1993). Changes in self-efficacy resulting from unaided attempts to quit smoking. *Psychology of Addictive Behaviors*, *7*, 219-224.
- Cohen, S. (1990). Control and the epidemiology of physical health: Where do we go from here? In J. Rodin, C. Schooler, & K. W. Schaie (Eds.), *Self-directedness: Cause and effects throughout the life course* (pp. 231-240). Hillsdale, NJ: Erlbaum.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, S95-S120.
- Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: Harvard University Press.
- Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). *Equality of educational opportunity*. Washington, DC: U.S. Government Printing Office.
- Connell, J. P. (1990). Context, self, and action: A motivational analysis of self-system processes across the lifespan. In D. Cicchetti & M. Beeghly (Eds.), *The self in transition: From infancy to childhood* (pp. 61-97). Chicago: University of Chicago Press.
- Connell, J. P., Spencer, M. B., & Aber, J. L. (1994). Educational risk and resilience in African-American youth: Context, self, action, and outcomes in school. *Child Development*, *65*, 493-506.
- Czikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience*. New York: Harper.
- Davidson, R. J. (1994). Asymmetric brain function, affective style, and psychopathology: The role of early experience and plasticity. *Development and Psychopathology*, *6*, 741-758.
- Davidson, R., Ekman, P., Saron, C., Senulis, J., & Friesen, W. V. (1990). Approach/withdrawal and cerebral asymmetry: Emotional expression and brain physiology, I. *Journal of Personality and Social Psychology*, *58*, 330-341.
- DeCharms, R. (1968). *Personal causation*. New York: Academic Press.
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum.
- Deci, E. L. (1995). *Why we do what we do: The dynamics of personal autonomy*. New York: Putnam.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- DiClemente, C. C., Fairhurst, S. K., & Piotrowski, N. A. (1995). Self-efficacy and addictive behaviors. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 109-141). New York: Plenum.
- Diener, C. I., & Dweck, C. S. (1978). An analysis of learned helplessness: Continuous changes in performance, strategy and achievement cognitions following failure. *Journal of Personality and Social Psychology*, *36*, 451-462.
- DiMatteo, M. R. (1994). Enhancing patient adherence to medical recommendations. *Journal of the American Medical Association*, *271*, 79-83.
- Durkheim, E. (1951). *Suicide* (J. Spaulding & G. Simpson, Trans.). New York: Free Press. (Original work published 1897)
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*, 256-273.
- Eccles, J., Midgley, C., Wigfield, A., & Buchanan, C. (1993). Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist*, *48*, 90-101.
- Elder, G. H. J. (1998). The life course and human development. In R. M. Lerner (Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (pp. 939-991). New York: Wiley.
- Elliott, D., Menard, S., Rankin, B., Elliott, A., Huizinga, D., & Wilson, W. J. (in press). *Beating the odds: Successful youth development in disadvantaged neighborhoods*. Chicago: University of Chicago Press.
- Erikson, E. H. (1953). Growth and crises of the healthy personality. In H. A. Murray & D. Schneider (Eds.), *Personality in nature, society, and culture* (2nd ed., pp. 185-225). New York: Alfred A. Knopf.
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology*, *46*, 839-852.
- Frankenhaeuser, M. (1983). The sympathetic-adrenal and pituitary-adrenal response to challenge: Comparison between the sexes. In T. M. Dembroski,

- T. H. Schmidt, & G. Blumchen (Eds.), *Biobehavioral bases of coronary heart disease* (pp. 91–105). Basel, Switzerland: Karger.
- Frese, M., & Sabini, J. (Eds.). (1985). *Goal directed behavior: The concept of action in psychology*. Hillsdale, NJ: Erlbaum.
- Furstenberg, Jr., F. F., Cook, T., Eccles, J., Elder, G., & Sameroff, A. (1998). *Managing to make it: Urban families and adolescent success*. Chicago: University of Chicago Press.
- Gecas, V. (1989). The social psychology of self-efficacy. *Annual Review of Sociology*, *15*, 291–316.
- Gecas, V., & Schwalbe, M. L. (1983). Beyond the looking glass self: Efficacy-based self-esteem. *Social Psychology Quarterly*, *46*, 77–88.
- Glass, D. C., & Singer, J. E. (1972). *Urban stress: Experiments on noise and social stressors*. New York: Academic Press.
- Gros, K. (1901). *The play of man* (E. L. Baldwin, Trans.). New York: Appleton.
- Gurin, P., & Brim, O. G. (1984). Change in self in adulthood: The example of sense of control. In P. B. Baltes & O. G. J. Brim (Eds.), *Life-span development and behavior* (pp. 282–334). New York: Academic Press.
- Gurin, P., Gurin, G., Lao, R. C., & Beattie, M. (1969). Internal-external control in the motivational dynamics of Negro youth. *Journal of Social Issues*, *25*, 29–53.
- Harlow, H. F. (1953). Mice, monkeys, men, and motives. *Psychological Review*, *60*, 23–32.
- Harter, S. (1978). Effectance motivation reconsidered. *Human Development*, *21*, 34–64.
- Harter, S., & Zigler, E. (1974). The assessment of effectance motivation in normal and retarded children. *Developmental Psychology*, *10*, 169–180.
- Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review*, *102*, 284–304.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Hendrick, I. (1942). Instinct and the ego during infancy. *Psychoanalytic Quarterly*, *11*, 33–58.
- Hiroto, D. S., & Seligman, M. E. P. (1975). Generality of learned helplessness in man. *Journal of Personality and Social Psychology*, *31*, 311–327.
- House, J. S., Lepkowski, J. M., Kinney, A. M., Mero, R. P., Kessler, R. C., & Herzog, A. R. (1994). The social stratification of aging and health. *Journal of Health and Social Behavior*, *35*, 213–234.
- Jones, E. E., & Davis, K. E. (1965). From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (vol. 2, pp. 219–266). New York: Academic Press.
- Kagan, J., & Berkun, M. (1954). The reward value of running activity. *Journal of Comparative and Physiological Psychology*, *47*, 108.
- Kahn, R. L. (1993). *An experiment in scientific organization*. Chicago: MacArthur Foundation Program in Mental Health and Human Development.
- Kang, D. H., Davidson, R. J., Coe, C. L., Wheeler, R. W., Tomarken, A. J., & Ershler, W. B. (1991). Frontal brain asymmetry and immune function. *Behavioral Neuroscience*, *105*, 860–869.
- Kelly, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska Symposium on Motivation* (vol. 15, pp. 192–238). Lincoln: University of Nebraska Press.
- King, V., & Elder, G. H. (1998). Perceived self-efficacy and grandparenting. *Journal of Gerontology*, *53B*, S249–S257.
- Kohn, M. L., & Schooler, C. (1983). *Work and personality: An inquiry into the impact of social stratification*. Norwood, NJ: Ablex.
- Krantz, D. S., Glass, D. C., Contrada, R., & Miller, N. E. (1981). *National Science Foundation's five-year outlook on science and technology*. Washington, DC: U.S. Government Printing Office.
- Lachman, M. E. (1986). Personal control in later life: Stability, change, and cognitive correlates. In M. M. Baltes & P. B. Baltes (Eds.), *The psychology of control and aging* (pp. 207–236). Hillsdale, NJ: Erlbaum.
- Lachman, M. E., & Weaver, S. L. (1998). The sense of control as a moderator of social class differences in health and well-being. *Journal of Personality and Social Psychology*, *74*, 763–773.
- Langer, E. (1979). The illusion of incompetence. In L. Perlmutter & R. Monty (Eds.), *Choice and perceived control* (pp. 301–313). Hillsdale, NJ: Erlbaum.
- Langer, E. (1983). *The psychology of control*. Beverly Hills, CA: Sage.
- Langer, E. J., & Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology*, *34*, 191–198.
- Laudenslager, M. L., Ryan, S. M., Drugan, R. C., Hyson, R. L., & Maier, S. F. (1983). Coping and immunosuppression: Inescapable but not escapable shock suppresses lymphocyte proliferation. *Science*, *221*, 568–570.
- Lefcourt, H. M. (1966). Internal versus external control of reinforcement: A review. *Psychological Bulletin*, *65*, 206–220.
- Lefcourt, H. M. (Ed.). (1981). *Research with the locus of control construct: Vol. 1. Assessment methods*. New York: Academic Press.
- Lefcourt, H. M. (1992). Durability and impact of the locus of control construct. *Psychological Bulletin*, *112*, 411–414.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224–253.

- Marmot, M. G., Smith, G. D., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Brunner, E., & Feeney, A. (1991). Health inequalities among British civil servants: The Whitehall II study. *Lancet*, *337*, 1387-1393.
- Marx, K. (1963). *Early writings* (T. B. Bottomore, Trans.). New York: McGraw-Hill. (Original work published 1844)
- Maslow, A. (1955). Deficiency motivation and growth motivation. In M. R. Jones (Ed.), *Nebraska Symposium on Motivation, 1955* (pp. 1-30). Lincoln: University of Nebraska Press.
- McAvay, G., Seeman, T. E., & Rodin, J. (1996). A longitudinal study of change in domain-specific self-efficacy among older adults. *Journal of Gerontology: Biological Sciences*, *51B*, B243-B253.
- Meier, S. F., Ryan, S. M., Barksdale, C. M., & Kalin, N. H. (1988). Stressor uncontrollability and the pituitary-adrenal system. *Behavioral Neuroscience*, *100*, 669-678.
- Mirowsky, J., & Ross, C. E. (1989). *Social causes of psychological distress*. New York: Aldine de Gruyter.
- Moos, R. H. (1987). *The social climate scales: A user's guide*. Palo Alto, CA: Consulting Psychologists Press.
- Moos, R. (1991). Connections between school, work, and family settings. In B. J. Fraser & H. J. Walberg (Eds.), *Educational environments: Evaluation, antecedents, and consequences* (pp. 29-53). Oxford, England: Pergamon Press.
- Moos, R. H., & Lemke, S. (1992). *The multiphasic environmental assessment procedure: A user's guide*. Palo Alto, CA: Consulting Psychologists Press.
- Murray, H. A. (1938). *Explorations in personality*. London: Oxford University Press.
- O'Leary, A. (1985). Self efficacy and health. *Behavioral Research Therapy*, *23*, 437-451.
- Overmeier, J. B., & Leaf, R. C. (1965). Effects of discriminative Pavlovian fear conditioning upon previously or subsequently acquired avoidance responding. *Journal of Comparative and Physiological Psychology*, *60*, 213-218.
- Pearlin, L., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior*, *19*, 2-21.
- Pearlman, C. (1984). The effects of level of effectance motivation, IQ, and a penalty/reward contingency on the choice of problem difficulty. *Child Development*, *55*, 537-542.
- Peterson, C., Maier, S. F., & Seligman, M. E. P. (1993). *Learned helplessness: A theory for the age of personal control*. New York: Oxford University Press.
- Peterson, C., Semmel, A., von Baeyer, C., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The Attributional Style Questionnaire. *Cognitive Therapy and Research*, *6*, 287-299.
- Piaget, J. (1952). *The origins of intelligence in children* (M. Cook, Trans.). New York: International Universities Press.
- Prussia, G. E., & Kinicki, A. J. (1996). A motivational investigation of group effectiveness using social cognitive theory. *Journal of Applied Social Psychology*, *81*, 187-198.
- Rescorla, R. A. (1967). Pavlovian conditioning and its proper control procedures. *Psychological Review*, *74*, 71-79.
- Rodin, J. (1986a). Aging and health: Effects of the sense of control. *Science*, *233*, 1271-1276.
- Rodin, J. (1986b). Health, control, and aging. In M. Baltes & P. Baltes (Eds.), *The psychology of control and aging* (pp. 139-165). Hillsdale, NJ: Erlbaum.
- Rodin, J. (1989). Sense of control: Potentials for intervention. *The Annals of the American Academy of Political and Social Science*, *503*, 29-42.
- Rodin, J., & Langer, E. (1977). Long-term effects of a control-relevant intervention with the institutionalized aged. *Journal of Personality and Social Psychology*, *35*, 897-902.
- Rodin, J., Rennert, K., & Solomon, S. K. (1980). Intrinsic motivation for control: Fact or fiction? In A. Baum & J. E. Singer (Eds.), *Advances in environmental psychology* (pp. 131-147). Hillsdale, NJ: Earlbaum.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, *80*(1), 1-28.
- Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology*, *43*, 56-67.
- Sampson, R. J. (1993). Family management and child development: Insights from social disorganization theory. In J. McCord (Ed.), *Advances in criminological theory* (pp. 63-93). New Brunswick, NJ: Transaction Press.
- Sapolsky, R. N. (1992). Cortisol concentrations and the social significance of rank instability among wild baboons. *Psychoneuroendocrinology*, *17*, 701-709.
- Satterfield, J. M., Monahan, J., & Seligman, M. E. P. (1997). Law school performance predicted by explanatory style. *Behavioral Science and the Law*, *15*, 95-105.
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*, 219-247.
- Seeman, M. (1959). On the meaning of alienation. *American Sociological Review*, *24*, 783-791.
- Seeman, M. (1975). Alienation studies. *Annual Review of Sociology*, *1*, 91-123.

- Seeman, M. (1991). Alienation and anomie. In J. Robinson, P. Shaver, & L. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 291–371). San Diego, CA: Academic Press.
- Seeman, M., & Seeman, T. (1983). Health behavior and personal autonomy: A longitudinal study of the sense of control in illness. *Journal of Health and Social Behavior*, *24*, 144–160.
- Seligman, M. E. P. (1975). *Helplessness: On depression, development, and death*. San Francisco: Freeman.
- Seligman, M. E. P. (1991). *Learned optimism*. New York: Alfred A. Knopf.
- Seligman, M. E. P., & Maier, S. F. (1967). Failure to escape traumatic shock. *Journal of Experimental Psychology*, *74*, 1–9.
- Seligman, M. E. P., & Visintainer, M. A. (1985). Tumor rejection and early experience of uncontrollable shock in the rat. In F. R. Brush & J. B. Overmeier (Eds.), *Affect conditioning and cognition: Essays on the determinants of behavior* (pp. 203–210). Hillsdale, NJ: Erlbaum.
- Shweder, R. A., Balle-Jensen, L., & Goldstein, W. (1995). Who sleeps by whom revisited: A method for extracting the moral goods implicit in praxis. In J. Goodnow, P. Miller, & F. Kessell (Eds.), *Cultural practices as contexts for development* (pp. 21–39). San Francisco: Jossey-Bass.
- Sieber, W. J., Rodin, J., Larson, L., Ortega, S., Cummings, N., Levy, S., Whiteside, T., & Herberman, R. (1992). Modulation of human natural killer cell activity by exposure to uncontrollable stress. *Brain, Behavior and Immunity*, *6*, 141–156.
- Skinner, E. (1995). *Perceived control, motivation, and coping*. Thousand Oaks, CA: Sage.
- Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, *71*, 549–570.
- Skinner, E. A., & Connell, J. P. (1986). Control understanding: Suggestions for a developmental framework. In M. M. Baltes & P. B. Baltes (Eds.), *The psychology of control and aging* (pp. 35–69). Hillsdale, NJ: Erlbaum.
- Sutton, S. K., & Davidson, R. J. (1997). Prefrontal brain asymmetry: A biological substrate of the behavioral approach and inhibition systems. *Psychological Science*, *8*, 204–210.
- Taylor, S. E. (1989). *Positive illusions: Creative self-deception and the healthy mind*. New York: Basic Books.
- Taylor, S. E., Repetti, R. L., & Seeman, T. (1997). Health psychology: What is an unhealthy environment and how does it get under the skin? *Annual Review of Psychology*, *48*, 411–447.
- Thoits, P. A. (1983). Multiple identities and psychological well-being. *American Sociological Review*, *48*, 174–187.
- Thompson, S. C., Cheek, P. R., & Graham, M. A. (1988). The other side of perceived control: Disadvantages and negative effects. In S. Spacapan & S. Oshamp (Eds.), *The social psychology of health* (pp. 69–93). Beverly Hills, CA: Sage.
- Thorlindsson, T., & Bjarnason, T. (1998). Modeling Durkheim on the micro level: A study of youth suicidality. *American Sociological Review*, *63*, 94–110.
- Timko, C., & Moos, R. H. (1989). Choice, control, and adaptation among elderly residents of sheltered care settings. *Journal of Applied Social Psychology*, *19*, 636–655.
- Wallston, K. A., & Wallston, B. S. (1982). Who is responsible for your health? The construct of health locus of control. In G. S. Sanders & J. Suls (Eds.), *Social psychology of health and illness*. Hillsdale, NJ: Erlbaum.
- Wegner, D., & Bargh, J. (1998). Control and automaticity in social life. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., pp. 446–496). New York: McGraw-Hill.
- Weinberg, R. S., Gould, D., & Jackson, A. (1979). Expectations and performance: An empirical test of Bandura's self-efficacy theory. *Journal of Sport Psychology*, *1*, 320–331.
- Weiss, J. M., Stone, E. A., & Harrell, N. (1970). Coping behavior and brain norepinephrine level in rats. *Journal of Comparative and Physiological Psychology*, *72*, 153–160.
- Wellborn, J. G., & Connell, J. P. (1987). *The Research Assessment Package for Schools*. Rochester, NY: University of Rochester.
- White, R. B. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, *66*, 297–333.
- Wilson, E. O. (1998). *Cosmopolitanism: The unity of knowledge*. New York: Alfred A. Knopf.
- Wortman, C., & Brehm, J. (1975). Responses to uncontrollable outcomes: An integration of reactance theory and the learned helplessness model. In L. Berkowitz (Ed.), *Advances in experimental and social psychology* (pp. 277–336). New York: Academic Press.
- Wright, R. (1998). Ability perception and cardiovascular response to behavioral challenge. In M. Kofta & G. Weary (Eds.), *Personal control in action: Cognitive and motivational mechanisms* (pp. 197–232). New York: Plenum.
- Zimmerman, M. A., & Rappaport, J. (1988). Citizen participation, perceived control, and psychological empowerment. *American Journal of Community Psychology*, *16*, 725–750.

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