
**Controlling Ourselves,
Controlling Our World:
Psychology's Role in
Understanding Positive and
Negative Consequences of
Seeking and Gaining Control**

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One of the greatest human fears is losing control,
and one of our strongest motivations is to have control over our lives.
The quality of our lives, the lives of those around us, and ultimately
the well-being of our planet may be determined by where and how we,
as individuals and a species, seek to maintain a sense of control.

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Controlling Ourselves, Controlling Our World

Psychology's Role in Understanding Positive and Negative

Consequences of Seeking and Gaining Control

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This article begins by examining psychology's contributions to understanding the positive consequences of control for individual mental and physical health. Person-environment control mismatches and the negative personal, interpersonal, and societal consequences of seeking and having control are then discussed. As corrections to mismatches and negative consequences, three methods of analyses are provided. First, definitional and conceptual precision is offered, including a more careful matching of control-related interventions to multidimensional, individual-specific control profiles. Second, therapeutic assessment and interventions are placed within a biopsychosocial model of control. Finally, philosophy of science and paradigmatic issues underlying control theories are highlighted, particularly as they affect psychology's role in examining values toward which control efforts should be directed. These topics are important for people's personal and collective well-being.

It was only in the late 1950s and the early 1960s that psychology began to seriously reexamine issues of personal control. Prior to that time, in an effort to break away from its philosophical roots, psychology relegated concepts such as self-control, will, and voluntary control of consciousness to the graveyard of epiphenomena (e.g., B. F. Skinner, 1953, 1971). The elimination of these terms, with their introspective (and sometimes teleological) philosophical assumptions, was seen as critical for psychology's materialistic and empirical development. Resurgence of interest came from multiple sources (cf. Klausner, 1965), including neoanalytic views of competence and dyscontrol (Menninger, Mayman, & Pruyser, 1963; White, 1959), early social learning theory (Rotter, 1954, 1966), and behaviorists' excursions into the "lion's den" of self-control and cognitive processes (e.g., Homme, 1965; Kanfer & Karoly, 1972; Meichenbaum, 1977; Thoresen & Mahoney, 1974).

In addition, reports appeared from India and Asia detailing extraordinary achievements of behavioral and cognitive control by Zen meditators and yogi masters (e.g., Anand, Chinna, & Singh, 1961; Kasamatsu & Hirai,

1966). With the development of increased technological sophistication (e.g., Green, Green, & Walters, 1970), Western scientists began examining the possibility of increased human control over what theretofore had been considered autonomic aspects of human functioning (e.g., DiCara, 1970; Kamiya et al., 1971; N. E. Miller, 1969; Pelletier & Peper, 1977).

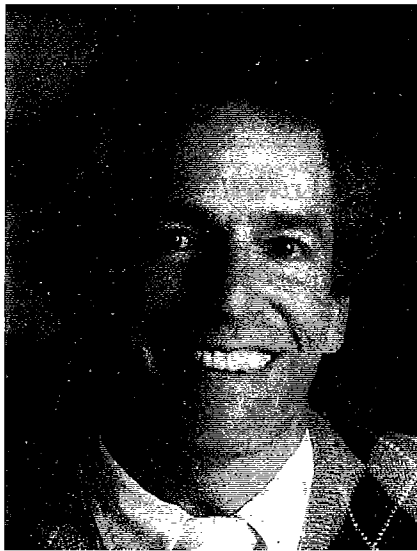
During the past three decades, psychologists have made a major contribution in addressing the question of how individuals gain and maintain a sense of control in their lives. Several control-related constructs have been developed and explored, and investigations have refined nonpharmacological self-regulation strategies to provide individuals with increased control over their affect, behavior, and cognitions. Hundreds of studies and dozens of books have been devoted to the theory, research, and applications of a variety of personal control strategies to numerous health care and psychotherapeutic concerns. This body of work has demonstrated that people's ability to gain and maintain a sense of control is essential for their evolutionary survival (Averill, 1973; Bandura, 1989b; D. H. Shapiro, in press; White, 1959), a central element in psychotherapy and mental health (Bandura, 1989a; Beck, 1976; Beck & Weishaar, 1989; Frank, 1982; D. H. Shapiro & Astin, in press; Taylor & Brown, 1988, 1994), and important for their physical health (Blumenthal, Matthews, & Weiss, 1994; Peterson & Stunkard, 1989; Rodin, Schooler, & Schaie, 1990; Syme, 1989).

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Furthermore, the benefits of having control on health and mood have been demonstrated across the human life span, from childhood (Cohen, Evans, Stokols, & Krantz, 1986; Rothbaum & Weisz, 1989; White, 1959) to middle adulthood (Averill, 1973; Langer, 1983; S. Miller, 1979, 1980; Thompson, 1981) to older adulthood (Abeles, 1990; Baltes & Baltes, 1986; Riley, 1990; Rodin, 1986; Rodin & Langer, 1977; D. H. Shapiro, Sandman, Grossman, & Grossman, 1995).

This article is intended to provide the general psychologist reader with a broad historical and cultural overview of the concept of control and its current place and status within psychology. The article further attempts to show the different meanings control can have, how culture-bound the notion of control can be, and that both greater specificity and greater vision are important for psychologists to bring to their understanding of control. To balance the broad scope of the article, and for those desiring more detail in any given section, several seminal articles are referenced that provide more in-depth coverage of that particular section.

Each section of the article involves adding layers of complexity to one's understanding of control. The first main section cites literature that uses a linear model to show the relationship between increased control and mental health, physical health, and adaptation to disease. The second main section discusses nonlinear models and control mismatches, describing situations where a sense of control could be maladaptive. The third main section offers more precision in understanding the construct of control, assessing an individual's control profile, and matching that person's control profile to a specific therapeutic intervention. The fourth main section places the previous three sections within a biopsychosocial model of control, including research on genetics and control as well as control and the immune system. The final section addresses values and paradigmatic issues.

Importance of Control in Mental and Physical Health

Control, Mental Health, and Psychotherapy

There is increasing agreement among both clinicians and researchers that control is one of the most critical variables involved in an individual's psychological health and well-being (cf. Bandura, 1989b; Beck, 1976; Beck & Weishaar, 1989; Seligman, 1991; Taylor & Brown, 1988, 1994). Mental well-being is associated with feeling in control of one's internal psychological environment (cognitions, beliefs, thoughts, and emotions) and its outward behavioral expression. Patients across diagnoses entering therapy make significantly more statements regarding "loss and lack of control" and "fear of losing control" than statements reflecting "having control" or the "belief that they can gain control" (D. H. Shapiro, Bates, Greensang, & Carrere, 1991). Therefore, a primary task of schools of psychotherapy is to help individuals recognize what forces are shaping their lives and to teach them to have more control over those forces (Bandura 1989b; Frank, 1982; Menninger et al., 1963; D. H. Shapiro & Astin, in press; Strupp, 1970).

Control and psychopathology. There are several clinical areas in which an impairment of control has been suggested as one of the central features: stress and anxiety-related disorders (Abramson, Garber, & Seligman, 1980; Bandura, 1988; D. H. Shapiro, 1990), depression (Deutsch, 1978; Matthews, 1977; Seligman, 1975), drug and alcohol addictions (Marlatt, 1983; Nathan, 1986; D. H. Shapiro & Zifferblatt, 1976a), eating disorders (Jeffrey, 1987; King, 1989; D. H. Shapiro, Blinder, Hagmann, & Pituck, 1993; G. J. Williams, Chamove, & Millar, 1990), and the at-risk population of adult children of alcoholics (Black, Bucky, & Wilder-Padilla, 1986; D. H. Shapiro, Weatherford, Kaufmann, & Broenen, 1994). Research has also shown that clinically specific control profiles can be developed for patients diagnosed with panic attacks, borderline personality, depression, or generalized anxiety (D. H. Shapiro, 1994a; D. H. Shapiro, Potkin, Jin, Brown, & Carreon, 1993).

Control profile of normal individuals. Psychologically normal individuals have a greater sense of control than do clinical populations. Normal individuals overestimate the amount of control they have in a situation, are more optimistic about their ability to achieve control, believe they have more skills and ability than they actually do (Lewinsohn, Mischel, Chaplin, & Barton, 1980; Seligman, 1991; Taylor & Brown, 1988), and overestimate their invulnerability and underestimate risk (Weinstein, 1984, 1993). They make explanatory attributions to protect their sense of control when behavioral control efforts are not successful, attributing the outcome to situational factors, a universal human condition, or a temporary situation (Peterson & Seligman, 1987; Seligman, 1991).

Psychological adaptation to physical disease. Sense of control is also related to positive psychological outcome in individuals with physical illness



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(cf. Affleck, Tennen, Pfeiffer, & Fifield, 1987). In general, research shows that those who believe there is something they can do about their disease, or about the stresses resulting from the disease, have a more positive psychological adaptation than do those who do not. The experience of personal control in late-stage cancer patients is positively correlated with scores on self-esteem, purpose in life (Lewis, 1982), quality of life, and positive mood (Cunningham, Lockwood, & Cunningham, 1990). One study revealed that personal sense of control was the only psychosocial factor that predicted adaptation in cancer patients after six months of follow-up (Ell, Nishimoto, Morvay, Mantell, & Hamovitch, 1989). Conversely, lack of control is related to the anxiety and depression experienced by many cancer patients (Derogatis et al., 1983; Freidenbergs et al., 1982; Greer & Silberfarb, 1982; Meyerowitz, 1983; D. H. Shapiro, Anton-Culver, et al., 1996).

Control and Physical Health

Research has shown that a person's sense of control can have pronounced effects on morbidity and mortality. In Alexander, Langer, Newman, Chandler, and Davies's (1989) study, nursing-home residents who were taught internal self-control strategies (relaxation, mindfulness, and meditation) tended to live longer than did those in a control group. In Rodin and Langer's (1977) often-cited study, nursing-home residents who were given control over deciding about external variables (e.g., time and nature of meals and movies) lived longer than a matched comparison group.

Similarly, research on a variety of diseases has indicated the importance of control in moderating outcomes. In studies of cancer patients, research suggests that low perceived control and a helpless attitude toward the disease are powerful predictors of first recurrence and death from the disease (Andersen, Kiecolt-Glaser, & Glaser, 1994; Antoni & Goodkin, 1988; Di Clemente & Temoshok, 1985; Greer, Morris, & Pettingale, 1979; Jen-

sen, 1987; Pettingale, Morris, Greer, & Haybittle, 1985; Schmale & Iker, 1961; Stavray, Buck, Lott, & Worklin, 1968; M. Watson et al., 1991). Issues of control have also been implicated in cardiovascular disease. Increased cardiovascular reactivity and risk have been associated with low perceived control, poor self-discipline, and external locus of control (cf. Bugental et al., 1993; Karasek, Theorell, Schwartz, Pieper, & Alfredsson, 1982; Schnall, Allred, Morrison, & Carlson, 1990; Wright, Carbonari, & Voyles, 1992). These findings are consistent with the studies cited above showing a linear relationship between control and health.

Negative Aspects of Seeking and Having Control

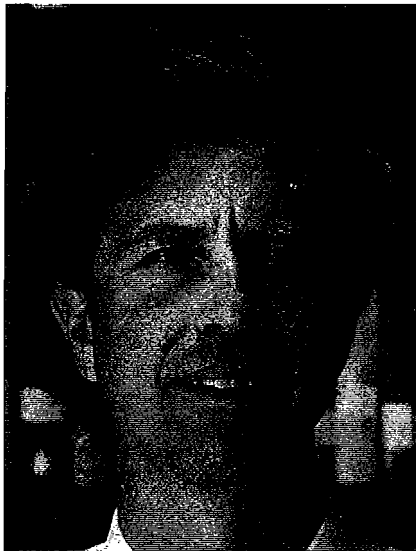
Overall, the above findings strongly support the importance of control in physical and mental health. They also give credence to the dominant psychological paradigm regarding control, which can be summarized as follows: (a) Having active, instrumental control is positive, and (b) the more control you have (or believe you have), the better (cf. Evans, Shapiro, & Lewis, 1993; Thompson, 1981).

Control Mismatches

However, early control researchers expressed caution regarding the benefits of control. For example, Averill (1973) noted that even in studies that showed a decrease in stress in the majority of participants who had control, as many as one fifth reflected the opposite pattern of response: Control over a stressor increased stress rather than reduced it. It may be the case that the relationship between control and health is not linear. In fact, just as some individuals with low perceived control are at high cardiovascular risk, other research suggests that individuals with too much belief in their own ability to control events (Friedman, 1989; Friedman et al., 1986; Jacob & Chesney, 1984; Seeman, 1991), those who make effortful attempts to exert social control and dominance (Brown & Smith, 1992; Houston, Chesney, Black, Cates, & Hecker, 1992), and those who have too high of a need for control (cf. Dembroski, MacDougall, & Musante, 1984; Glass, 1977) evidence greater cardiovascular reactivity and risk.

Recent research has suggested that for certain people, there are mismatches between the amount of control available to them in their environment and personal variables. These personal variables include (a) behavioral competencies (skill and ability), (b) control cognitions (self-efficacy and responsibility), and (c) control motivation (desire for control). Indeed, Evans et al. (1993) cited more than 60 studies of mismatches falling into two sets of conditions.

The first set of conditions, involving high environmental affordances, indicates that giving more control to an individual who does not want it (low desire for control, high external locus of control, and low belief in self-efficacy) or who cannot effectively utilize it (low behavioral competencies) is damaging. The second set of conditions



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occurs when low environmental affordances exist, that is, when there is no opportunity to effectively exert active control but the person has a high need for control, a high belief in his or her ability to gain control, or high behavioral competencies. This set of mismatches directly counters the dominant psychological paradigm by indicating when seeking or having active control is not helpful, thereby moving beyond an overly simplistic linear function between active control and well-being (cf. Burger, 1989).

Early on, Rotter (1966) also warned of potential problems, noting in his seminal monograph that a very high internal locus of control score on his scale might be indicative of dysfunction. There is increasing recognition that Western psychology's understanding of control as active and instrumental has many culture-bound features (D. H. Shapiro, Evans, & Shapiro, 1987; Weisz, Rothbaum, & Blackburn, 1984). Active personal control is not always facilitative nor desirable (Thompson, Cheek, & Graham, 1988). Active attempts at mastery are most effective when events are actually controllable. When events are beyond an individual's personal control, problems may be exacerbated by persistent efforts at control, a strong sense of self-efficacy, or a high desire for control. Furthermore, negative consequences can result even from successful efforts at gaining or maintaining a sense of control.

Negative Personal Consequences

Efforts to gain active control, belief in one's own efficacy, or a high desire for active control may have negative consequences on health, such as increased cardiovascular risk (mediated through anger and hostility; Glass, 1977; D. H. Shapiro, Lindberg, Daniels, Breuer, & Astin, 1994; R. Williams, 1989) and restricted eating disorders (Mitchell, Hatsukami, Pyule, & Eckert, 1986; D. H. Shapiro, Blinder, et al., 1993). In addition, denial and unrealistic optimism may enhance self-confidence in the short term,

but the resulting feelings that one is in control, and therefore immune to risks and hazards, may reduce long-term health-promoting efforts (Weinstein, 1984, 1993). Belief in personal control can also lead to increased anxiety as well as self-blame (Cassileth, as cited in Dreher, 1988; J. Shapiro & Shapiro, 1979). For example, solely emphasizing patient responsibility and fighting spirit in beating cancer can imply that recurrence is a personal failure (Gray & Doan, 1990; Spiegel, 1991).

Finally, the issue of control and mental health must be examined more carefully. When an alcoholic says, "I am not an alcoholic because I never drink until noon," or "I could stop if I want to," he or she is gaining a sense of control through denial that is both illusory (Langer, 1975) and harmful. As any clinician knows, the course of successful psychotherapy is often not a linear increase in feelings of personal control. Rather, the very nature of therapy often involves helping the patient to relinquish unhealthy defenses, which can cause increased feelings of loss of control in the patient. Yet, vulnerability and feelings of loss of control can be critical for deeper self-exploration and can set the stage for subsequent self-directed change, greater self-acceptance, or both (D. H. Shapiro & Astin, in press).

An illusory sense of control (Langer, 1975) may distinguish between clinical populations and normal populations (e.g., Taylor & Brown, 1988, 1994). However, equating the control beliefs, desires, and strategies of normal individuals with positive psychological health may not be warranted (Shedler, Mayman, & Manis, 1993, 1994; Walsh & Shapiro, 1983). Although some defenses are healthy (e.g., Lazarus, 1983), it has long been argued (Freud, 1923; B. F. Skinner, 1953) that humans do not have as much awareness of and control over their behavior, thoughts, and moods as they believe. Whether nonconscious or unconscious, normal mental control strategies are often both reflexive and self-deceptive. Although normal individuals believe in cognitive consistency and attribute actions to free will and choice, they are much more influenced by biological cues, environmental variables, and cultural norms than they acknowledge (e.g., Mischel, 1968, 1981, 1984). Psychological health may require a more conscious investigation of normal control desires, strategies, and goals. It may also involve breaking down normal control illusions that are harmful for either the individual or the collective. Finally, it may be necessary to reformulate alternative higher level desires, goals, and strategies that are neither reflexively biologically based nor culturally bound (cf. D. H. Shapiro, 1983d; Tart, 1986; Walsh & Vaughan, 1994; Weisz, Rothbaum, & Blackburn, 1984).

Negative Interpersonal and Societal Consequences

On an interpersonal level, a sense of control through downward comparison (Taylor, 1983) may be helpful to an individual's or a group's sense of control. However, such comparisons can be at the expense of and cause

harm to others in the form of ethnic, gender, racial, or biological discrimination (Goleman, 1989).

Furthermore, there are limits to the benefits of individual autonomy. A high need for control may adversely affect one's intimate relationships (Schutz, 1958; D. H. Shapiro & Shapiro, 1992; J. Shapiro & Shapiro, 1984). In addition, reinforcement theory would predict that success in gaining control in one area may only increase the desire for more control. The negative aspect of increased desire for and success at gaining personal control can be seen in a materialistic consumer culture where natural resources are depleted (Elgin, 1981), personal altruism is usurped by personal "self-interest" (Kanfer, 1979), and adverse international consequences can result from the desire for control and power (Frank, 1987).

Matching Control Profile to Intervention

Therapeutic interventions can address the mismatches and negative consequences of control by developing a more precise model to match the person, the problem, and the intervention (cf. D. H. Shapiro, 1983a). Paul's (1966) classic formulation for psychotherapy research can be stated in control terms: What control-related intervention is most effective for this individual patient with this specific control profile and with this particular control-related problem? To address this question, there is a need for (a) greater definitional and conceptual rigor in understanding control, (b) more precision in measuring the multifaceted nature of control, and (c) clarification regarding control-based interventions.

Need for Greater Precision

Simple unified theories of control are no longer adequate (Menninger et al., 1963) because the construct of control is more complex and multifaceted than was initially thought (Carver & Scheier, 1981; Carver, Scheier, & Weintraub, 1989; Langer, 1983; Peterson & Seligman, 1987; Rosenbaum, 1993; Rotter, 1990; G. E. Schwartz, 1979a, 1979b, 1983; Seligman, 1975, 1991; Strickland, 1990). Greater definitional and conceptual precision along the following dimensions (cf. Hinson, 1988; Imada & Imada, 1988; Logue, 1988; Rodin, 1990; Syme, 1989) is now needed to reflect this increased understanding.

Psychological control and its relationship to other constructs. It has been suggested elsewhere (Everly, 1989; Rodin, 1990; Rodin & Salovey, 1989) that control may be the critical component underlying a number of related psychological constructs. For example, Seligman's (1975) concept of learned helplessness, as outlined by Taylor (1995, p. 235), results from experiencing repeated instances of lack of control. Similarly, Bandura's (1977) construct of self-efficacy, the subjective assessment that one has the internal-external resources to cope with a given or hypothetical situation, has also been conceptualized as the "self-appraisal of competence and control" (Everly, 1989). In terms of coping, Folkman (1984) suggested that generalized beliefs about control influence

primary cognitive appraisals whereas situational appraisals of control are an important component of secondary appraisal (the evaluation of coping resources and options). Weinstein (1993) highlighted the close correlation between controllability and optimism, and Peterson (1990, p. 243) discussed optimistic-pessimistic attribution theory and explanatory style (Peterson, Seligman, & Vaillant, 1988) as a "control cognate." Fiske (1993) recently defined power as "asymmetrical control over another person's outcomes" (p. 623). Furthermore, analyses of the hardiness personality type suggest that it may not represent a unitary construct and that sense of personal control may be the critical component that mediates this construct's relationship to health outcomes (Cohen & Edwards, 1989).

Finally, Strupp (1970) noted that issues of control underlie all therapeutic approaches, and Frank (1982) argued that individuals seek psychotherapy because of demoralization involving one or more of the following: subjective incompetence, loss of self-esteem, alienation, hopelessness (feeling that no one can help), or helplessness (feeling that other people could help but will not). Frank noted that these feelings are accompanied by a sense of loss of control and that all schools of psychotherapy attempt to bolster a patient's sense of control, mastery, and self-efficacy by providing them with (a) conceptual schemes that both label and explain symptoms and (b) experiences of success.

The above discussion is not meant to imply that there is absolute overlap between control and other constructs. However, it does suggest that control is of central theoretical and empirical importance in psychology and psychotherapy. Next, we address some problems in understanding control itself.

Actual versus perceived control. Researchers often mix different aspects of the control construct. For example, Peterson and Stunkard (1989) defined personal control as an "individual's *belief* [italics added] about the degree that he or she can bring about good events and avoid bad events" (p. 819) but then cited research where control was operationalized as actual ability to change environmental contingencies.

Process versus outcome. Some researchers have failed to distinguish between process and outcome. For example, Averill (1973) defined cognitive control as "processing of potentially threatening information in such a manner as to reduce the net long-term stress and/or the psychic cost of adaptation" (p. 293). By so doing, Averill equated cognitive control (a technique) with an effective outcome (cf. Folkman, 1984; Thompson, 1981). E. A. Skinner, Chapman, and Baltes (1988) referred to this problem as the difference between means and ends.

Expectancy versus efficacy. There is a difference between locus of control as a generalized expectancy (Rotter, 1966) and an individual's belief about his or her ability to control a specific area, what Bandura (1977) called "self-efficacy" and what Weisz (1990) referred to as "contingency versus competence."

Continuum versus absolute. Weisz et al. (1984) initially defined control as "causing an intended event" (p. 958), thus making control an all-or-nothing outcome response. Later, their definition was softened to "causally influence in an intended direction" (Rothbaum & Weisz, 1989, p. 85), in which control could be partial (influential).

Developing an Individual-Specific Control Profile

The belief that one has control can often be as important as actually having control (Bandura, 1977; Glass & Singer, 1973; Lefcourt, 1973; Taylor & Brown, 1988). Therefore, it is critical to investigate a person's self-perceptions regarding control. Over the past three decades, the measurement of perceived human control has moved from a general domain to specific domains and from human control as a unitary construct to human control as a multifaceted, molar construct (Rotter, 1966; D. H. Shapiro, 1994a; Wallston, Wallston, & DeVellis, 1978). A comprehensive individual-specific control profile must be multidimensional and clinically relevant (Hayes, Nelson, & Jarrett, 1987). In addition, as Matarazzo (1992) noted, it should seek to determine neurobiological correlates for the psychological construct. Recent research has sought to link control constructs with brain regions—functional neuroanatomy—through positron emission tomography (D. H. Shapiro, Wu, et al., 1995). Having control was positively correlated with activation of frontal cortex components and negatively correlated with limbic system activation, particularly activation of the amygdala.

Locus of control. On the basis of the work of Levenson (1974, 1981) and others (e.g., Viney, 1974), it was shown that the internal and external general domain, forced-choice locus of control scale developed by Rotter (1966) did not reflect merely one dimension. Rather, internal and external dimensions of control expectancy proved to be orthogonal, showing a zero correlation with each other. This finding led Wallston et al. (1978) to develop a "second-generation" control test—the Multidimensional Health Locus of Control Scales, including both internal and external powerful other and external chance dimensions of perceived control. The locus of control scales can serve as predictors of subsequent health-related behaviors (cf. Bundeck, Marks, & Richardson, 1993) if efficacy and domain reinforcement variables are also considered (cf. Wallston, 1992).

Domains addressed. Whereas Rotter's (1966) test was domain-general, most subsequent efforts in control assessment have been primarily domain-specific, such as Wallston et al.'s (1978) Multidimensional Health Locus of Control Scales, and even disease-specific (e.g., cancer, diabetes, pain). Research has established the importance and higher validity of domain-specific data (Steptoe & Appels, 1989; Wallston, 1989). Therefore, there are efforts to measure the role of control in domains such as interpersonal relations (Schutz, 1958), career (Parkes, 1989), family (Moos & Moos, 1994), and beliefs about the nature of the universe (Kass, Friedman, Leserman, Zuttermeis-

ter, & Benson, 1991). However, there are limitations to using single-domain scales. Burger (1989) and Thompson et al. (1988) stated that control can have multidimensional effects and successfully gaining control in one area may be offset by loss of control (or fear of loss of control) in another. Furthermore, without multiple-domain assessment, it is impossible to determine to what extent loss of control in one area generalizes to other areas. Therefore, measurement of control in both general and specific domains is important (cf. Broenen & Donk, 1992).

Control as a motivational variable. Neither Rotter's (1966) nor Wallston et al.'s (1978) scales involve a motivational variable of desire or effort for control. However, research has since shown that desire for control (over the external environment) is different than Rotter's locus of control (Burger, 1985; Burger & Cooper, 1979). In addition to desire for control over the external environment, there is also desire for control over one's own choices, thoughts, and emotions (Deci & Ryan, 1985; Lefcourt, 1973).

Control-Related Interventions and Coping Strategies

Positive assertive mode of control. Most of the Western psychological research on control has focused on an active, altering mode of control to influence or change a situation. This mode has been referred to by various researchers as a mastery model (Wolpe, 1969), problem-focused instrumental coping (Lazarus, 1981), situational reconstruction (Maddi & Kobasa, 1984), and primary control (Rothbaum, Weisz, & Snyder, 1982; Weisz et al., 1984). This assertive, decisive, instrumental, fighting-spirit mode is contrasted with a negative yielding mode: a timid, passive, helpless, hopeless, resigned, fatalistic, avoidant coping style involving too little active control (cf. Andersen et al., 1994; Burger & Cooper, 1979; Roth & Cohen, 1986; Suls & Fletcher, 1985).

Positive yielding mode of control. Another mode of control is a yielding one, accepting the situation or oneself. In Western psychological research, this mode has been perceived as being of secondary benefit, to be utilized in order to accept that which is not within one's active personal control. An implicit (if not explicit) bias favoring active change as the preferential control strategy can be seen in the terms used to differentiate this type of control: mastery versus *coping* (Goldfried, 1973; Meichenbaum, 1977), instrumental versus *palliative* coping (Lazarus, 1981), primary versus *secondary* control (Weisz et al., 1984), and situational reconstruction versus *compensatory* self-improvement (Maddi & Kobasa, 1984). This Western bias toward active change is reflected in most psychological control assessment inventories and many coping questionnaires, which do not distinguish between positive yielding (acceptance) and negative yielding (too little control; cf. Feifel, Strack, & Nagy, 1987; Levy, Herberman, Maluish, Schlien, & Lippman, 1985; Rotter, 1966; Wallston et al., 1978). However, psychological theory, research, and practice are beginning to recognize the importance of this accepting mode of control

as a complementary balance to active change strategies as well as a therapeutic goal in its own right (Carver et al., 1989; Gray & Doan, 1990; Linehan, 1993; D. H. Shapiro, 1978, 1982, 1983b; Weisz et al., 1984).¹

Agency of Control

The term *agent* refers to the source from which control is initiated and is used to distinguish the concept from locus of control, which is associated with generalized expectancy.²

Sense of control from self. Psychological research has attempted to develop and refine nonpharmacological self-control strategies to provide individuals with the ability to gain awareness of and to regulate (if desired) attentional, affective, cognitive, and behavioral variables (Rosenbaum, 1993; Shapiro, 1994b; D. H. Shapiro & Zifferblatt, 1976b). Collectively, self-control techniques include, but are not limited to, self-hypnosis, biofeedback, autogenic training, guided imagery, cognitive modification, behavioral self-control, and meditation. Some strategies, such as behavioral self-control, have included modifying the environment to enhance self-control (Bandura, 1989b; Mahoney & Thoresen, 1974; D. L. Watson & Tharp, 1993). Thus, there are two self-directed pathways by which individuals can gain and maintain a sense of control: controlling oneself or exerting control over the environment (cf. Bandura, 1989a; Rothbaum et al., 1982; D. L. Watson & Tharp, 1993).

Control from others; other as agent. Research has also shown the positive effects of control-enhancing options from the environment (physical and social) that give individuals choices for self-determination (e.g., Rodin & Langer, 1977). Furthermore, those individuals who do not use self-control strategies can gain a positive sense of control by believing that someone else is in control: control by a benevolent other (e.g., a doctor or a higher power; J. Campbell, 1964, 1972; Frank, 1977; Kass et al., 1991; Kleinman, 1987; D. H. Shapiro, 1989a, 1989b; Taylor, Lichtman, & Wood, 1984; Wallston et al., 1978).

Religious beliefs and the nature of the universe. Although not often directly examined, most Western medical therapeutics, psychotherapies, and scientific psychology models are based on an assumptive belief system that views the universe as indifferent to human needs and without intrinsic meaning and purpose (Ellis, 1984; cf. Lerner, 1975; May & Yalom, 1989; Sampson, 1981, 1985; Woolfolk & Richardson, 1984; Yalom, 1980). However, for some individuals, religious beliefs can provide a sense of control (e.g., Bergin, 1991; J. Campbell, 1972; Carver et al., 1989; Frank, 1977; Kurtz, 1979; D. H. Shapiro, 1989b; Smith, 1983) over uncontrollable outcomes, undesirable life events, and uncertainties (Druckman & Swets, 1988; Silver & Wortman, 1980; Wortman & Brehm, 1975) and in facing pain, illness, decay, and death, involving progressive loss of control and deterioration of independence and autonomy (Becker, 1973; Lazarus & DeLongis, 1983; Taylor, 1983). Such beliefs in a universe that is just (Lerner, 1975), purposive, and controlled by a powerful benevolent other

can have a positive effect on both psychological and physical health (Bergin, 1991; Cameron, Mallon, Richards, & Bigler, 1987; Kass et al., 1991; Kleinman, 1980, 1987; McIntosh & Spilka, 1990; D. H. Shapiro, 1989a; Weisz et al., 1984; Wikan, 1989).

Control Profile Example

In a recent study using a multidimensional measure of control (D. H. Shapiro, 1994a), two different profiles associated with high cardiovascular risk were identified (D. H. Shapiro, Lindberg, et al., 1994). Cardiovascular risk was determined by serum glucose level, left ventricular hypertrophy, serum cholesterol level, HDL level, and systolic blood pressure, after adjusting for age and sex. As can be seen in Figure 1, both Participant 1 (with cardiovascular risk four times the U.S. average) and Participant 2 (with cardiovascular risk three and one-half times the U.S. average) had low domain-specific sense of control scores.

However, from there, their control profiles differed markedly from each other. Participant 1's profile showed an elevated score on both the desire for control scale and the negative assertive, overcontrolling scale. Furthermore, this participant showed a low score on the agency dimension of "others as a positive source of control": an unwillingness to rely on or trust others for help in gaining a sense of control.

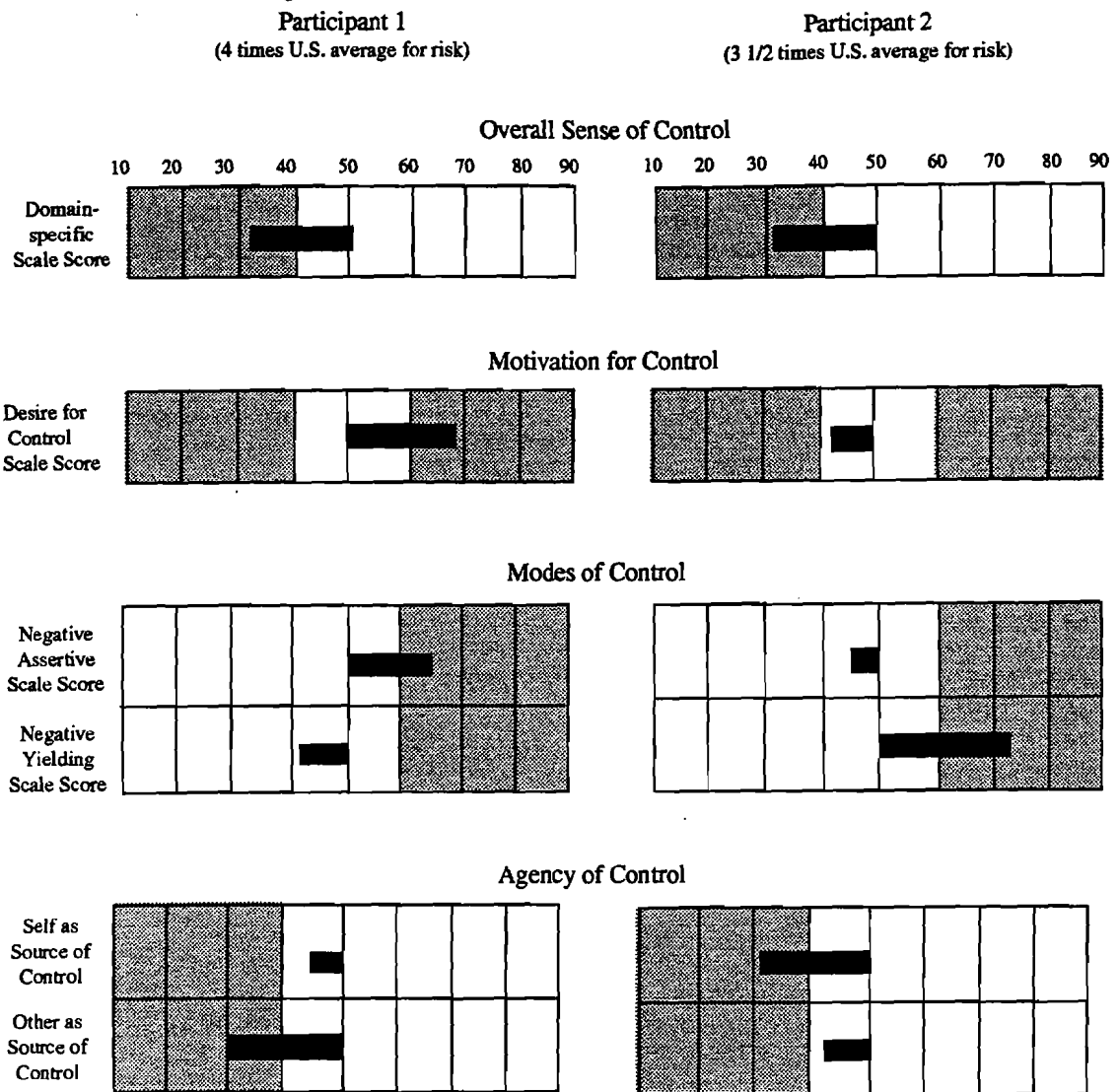
In contrast, Participant 2 had a normal desire for control score but an elevated score on the negative yielding scale (too little control) and a low score on "self as a positive source of control." This example suggests that there is no single homogeneous control profile reflective of cardiovascular risk.

In addition, different control-related therapeutic interventions would be needed depending on the individual's control profile. For example, individual-specific matching of control-related interventions would involve teaching Participant 1 ways to decrease negative assertive overcontrol and desire for control and to increase the ability to gain a sense of control from others through techniques such as meditation and relaxation training. The intervention for Participant 2 would involve decreasing feelings of negative yielding (helplessness and too little control) and increasing feelings of agency of control from

¹ Conceptualizing yielding and acceptance as control may be difficult given one's cultural conditioning. Lao-tzu (1936), the fifth-century Chinese philosopher, discussed the yielding (wu-wei) mode of control as the watercourse way. Water, when it flows, effortlessly accepts and yields to the presence of any rock in the stream. Yet, long term, it is the water that survives and the rock that is worn away. This mode is certainly not just Eastern. For example, Epictetus (1956), a cofounder of stoicism, noted in the *Enchiridion*, "Seek not that the things should happen as you wish; but wish the things which happen to be as they are, and you will have a tranquil flow of life" (p. 174).

² The object of control is what is controlled by the agent. Having the agent and the object as the same individual (i.e., self-control) does not necessitate recourse to dualism but can be considered descriptive, a proposition with which Bandura (personal communication, October 1990) did not take exception.

Figure 1
Control Profile of Two Patients at High Cardiovascular Risk



Note. All scores are standardized with a mean of 50, and each 10-point increment represents 1 standard deviation. The solid black bars represent the participants' scores on each control dimension, and any bar falling in the gray shaded area represents a control score of at least 1 standard deviation in a nonpsychologically healthy direction.

self through techniques such as assertiveness and self-efficacy training.

Several studies have successfully utilized forms of this matching approach between control personality variables and individual differences with a particular control-enhancing intervention (Bugental, Whalen, & Henkert, 1977; Burish et al., 1984; Nowlis & Edgar, 1987; Reich & Zautra, 1990; G. E. Schwartz, 1983; D. H. Shapiro, 1990).³ This matching needs to take into consideration how gender and sex roles influence the nature of control concerns, as well as the goals for and strategies of control (D. H. Shapiro & Shapiro, 1983). Flexible cop-

ing is possible only when an individual has the skills for both modes of control and can use them either in an

³ This matching example is one way in which control theory, research, and practice can be integrated. However, it is clear that the matching model presented here does not take into consideration all the elements that would go into a multifaceted, control-based intervention. That would involve clarifying assumptions about personal control and responsibility (Brickman et al., 1982; Globus, 1980; Knowles, 1977; J. Shapiro & Shapiro, 1979) brought into the therapy-health care session, assessing the assault to the patient's sense of control, and determining the individual's preferred mode of control (change, acceptance, or both) for addressing the control concerns (cf. D. H. Shapiro & Astin, in press).

integrated way or differentially depending on the exigencies of the circumstances. Furthermore, matching may require teaching patients coping flexibility (C. E. Schwartz & Rogers, 1994) so that different modes of control can be used at different points in treatment (e.g., Heim et al., 1987; Heim, Schaffner, & Valach, 1992), in different person-situation interactions (cf. Kenrick & Funder, 1988; Mischel, 1968, 1979), as well as during various developmental phases (e.g., Heath, 1983; Levinson, Darrow, Klein, Levinson, & McKee, 1978; Vaillant, 1977; Weisz, 1990). Finally, gaining control through assertive change and yielding-accepting modes is not mutually exclusive. For example, both positive assertiveness and positive yielding increased as a result of a two-year cognitive-behavioral intervention with Type A individuals experiencing a myocardial infarction (D. H. Shapiro, Friedman, & Piaget, 1991).

Biopsychosocial Model of Control

In the fields of health psychology and behavioral medicine, a biopsychosocial model (cf. Engel, 1977; G. E. Schwartz, 1982) has been proposed to explain the multifactorial nature of health and illness. This model emphasizes the complex interplay of psychological, social, and biological factors in determining various health outcomes.

The model outlined in Figure 2 provides a framework for understanding how psychological control, in interaction with social-environmental and biological-genetic factors, can influence psychophysiological functioning and, ultimately, physical and mental health. Although we recognize that the interactions can be and often are multidimensional, the model delineated is two-dimensional for the sake of clarity of presentation. We now turn to the far-left portion of our model—the genetics of control.

Genetic Basis of Control

Although the genetic etiology of complex human behaviors and personality factors continues to be controversial (cf. Baumrind, 1993; Jackson, 1993; Mann, 1994), research in behavioral genetics suggests that the degree to which individuals are able to exercise behavioral self-control or perceive themselves to be in control of their internal and external environments may be partially determined by genetic factors.

For example, studies on twins suggest a genetic contribution for the locus of control personality trait. Pedersen, Gatz, Plomin, Nesselrode, and McClearn (1989) compared correlations on locus of control between monozygotic and dizygotic twins raised together or apart. Their results suggest that genetic factors explain more than 30% of the variance in both life direction (sense of personal control over the direction of one's life) and responsibility (beliefs about how responsible people are for misfortunes in their lives). J. Z. Miller and Rose (1982) found correlations on Rotter's (1966) internal-external locus of control scale for college-aged identical twins raised together to be more than twice as high (.18-.46) as those found with fraternal (dizygotic) twins.

The genetic contributions to health behaviors assumed to involve personal control, such as smoking and alcohol use, have also been investigated. For example, in a review of the literature in this area (Rose, 1995), studies were cited showing significant genetic effects on both initiation and persistence of cigarette smoking. Data with both adolescent and adult samples showed monozygotic twins had a significantly higher (as much as twofold) likelihood of being smokers than did dizygotic twins. Rose also cited numerous studies showing some genetic component to alcohol consumption. Smoking and drinking, along with use of caffeine, appear to be highly correlated with one another. When grouped together, genetic factors account for between 36% and 56% of the variance of "polysubstance" use (Swan, Cardon, & Carmelli, 1994). Despite these provocative findings, the precise degree of genetic-environmental contribution to personal control and health behaviors remains unclear (Rose, 1995). Finally, the phenomenon of social dominance observed in a number of animal species (e.g., Koolhaas & Bohus, 1989) may be a genetic link to the human desire to exert control and socially dominate others (Fiske, 1993).

Social-Environmental Factors and Control

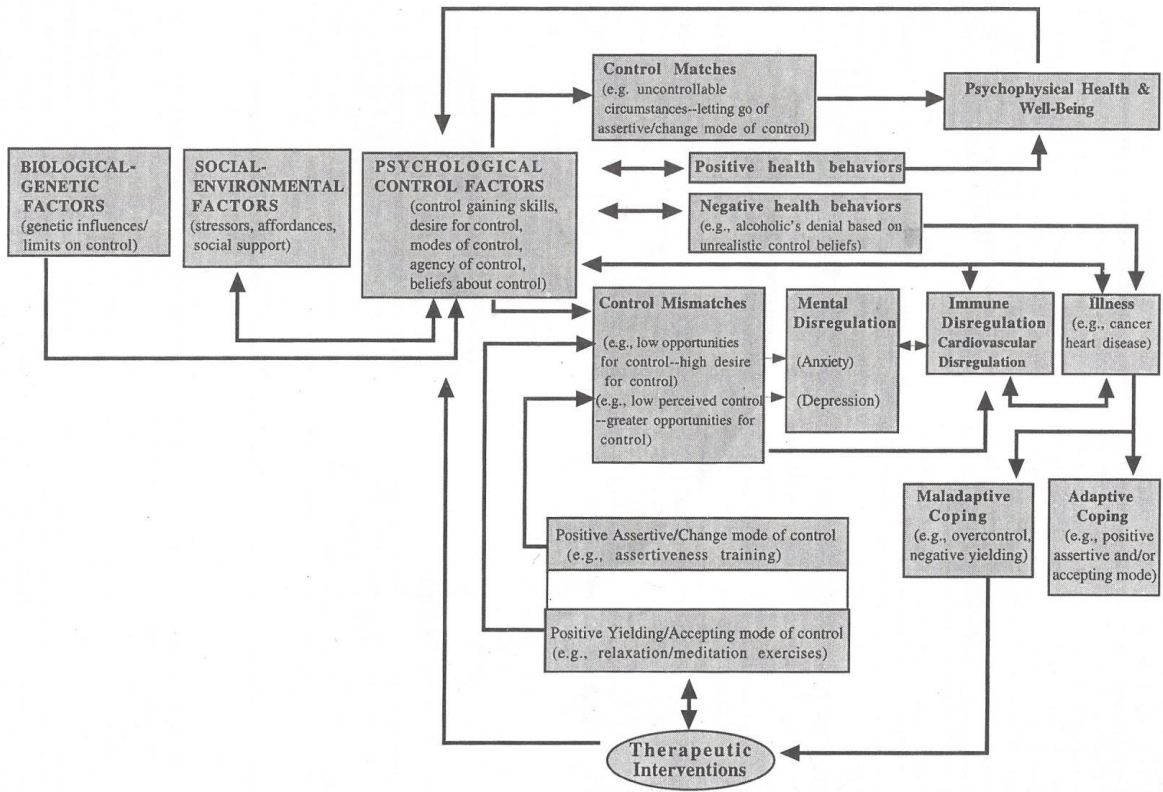
Under this heading, we include environmental affordances, whose interactions with control we have already detailed. We also include stressors. Control appears to moderate the relationship between job demands and levels of stress (environment-control interaction; Frankenhauser, 1975; Karasek et al., 1982; Parkes, 1989). It has also been suggested that enhanced sense of control may be an important mediator between social support and positive health outcomes (cf. Rodin & Salovey, 1989; Syme, 1989).

Psychological Control: Matches and Mismatches

To the right of psychological control in Figure 2, we have placed control matches and control mismatches. We have also noted that sense of control can be positive, leading to positive health behaviors, and maladaptive, leading to negative health behaviors (cf. Weinstein, 1984, 1993). One reason why control mismatches and a maladaptive sense of control may be dysfunctional is that they lead to immune system dysregulation.

Control and Immune Functioning

A number of animal studies suggest that control may be an important psychological mediator of the relationship between stress and immune function. Several researchers have demonstrated that animals faced with inescapable shock exhibit poorer immune responsiveness (e.g., lymphocyte proliferation and tumor rejection) as compared with animals faced with escapable shock (Dantzer, 1989; Laudenslager, Ryan, Drugan, Hyson, & Maier, 1983; Mormede, Dantzer, Michaud, Kelley, & LeMoal, 1988; Visintainer, Volpicelli, & Seligman, 1982). Similarly, there have been several human laboratory and field studies that suggest that low perceived control may suppress immune functioning (Kamen, Rodin, Seligman, & Dwyer, 1991;



Rodin, 1986; Sieber et al., 1992) and that personal self-efficacy—believing that one can control phobic stressors—is associated with an enhancement of immune function (Wiedefeld et al., 1990). A number of studies by Kiecolt-Glaser and associates (Kiecolt-Glaser, Garner, Speicher, Penn, & Glaser, 1984; Kiecolt-Glaser & Glaser, 1992; Kiecolt-Glaser, Glaser, Dyer, Shuttleworth, Ogrocki, & Speicher, 1987) have consistently demonstrated the immunosuppressive effects of both acute and chronic stressors. Hassenfeld (1993) suggested that the findings of the studies by Kiecolt-Glaser and colleagues, particularly with respect to medical students, are attributable to the inhibiting effect on immune functioning of not feeling in control.

In terms of control dispositions and the immune system, Brosschot et al. (1994) examined the possible interactive effects of locus of control and life stress on immune reactivity to a stressor and found there was a significant relationship between an external locus of control and lower levels of monocytes as well as a positive relationship between an internal locus of control and higher numbers on this immune measure.

The above findings suggest a linear relationship between control and immune functioning; that is, less perceived control or an external locus of control is associated with decreased immune responsiveness. However, as was also noted in the section on person-environment interactions, there are findings that suggest the relationship between control and immune functioning may not always be linear. For example, Weisse et al. (1990) found that it was actually participants who were given control over a stressor who evidenced a significant reduction in lymphocyte responsiveness. Therefore, future research on immune system responsiveness should consider the interaction between control dispositions, the amount of control, and when there may be potential adverse effects from having or gaining control.

Bidirectional Influences and Therapeutic Interventions

Through its complex interactions with social, environmental, and biological factors, control appears to influence physiological processes as well as mental and physical health. The relationship between control and psychophysiological function and dysfunction can be clarified by examining control matches and mismatches and their differential effects on various physiological processes and health outcomes. Furthermore, as this model suggests, psychophysical well-being or dysregulation can, in turn, affect sense of control, beliefs about control, and subsequent health behavior. For example, job demands, mediated by low perceived control, may lead to heightened cardiovascular reactivity and feelings of fatigue, which can subsequently further lower one's sense of control over social-environmental stressors (cf. Parkes, 1989).

The complex feedback loops outlined in Figure 2 accentuate the need for precision in elucidating the relationships between control and other factors. Control may function as a cognitive mediator between stressful life events and health outcomes (Anderson, Kiecolt-

Glaser, & Glaser, 1994; Lazarus, DeLongis, Folkman, & Gruen, 1985) as well as a predictor of health practices (Wallston, 1992; Wallston, Wallston, Smith, & Dobbins, 1987). Control has also been conceptualized as an outcome criterion—quality of life—for those with chronic physical illness (e.g., Specia, Robinson, Goodey, & Frizzell, 1994).

Without precision (cf. Baron & Kenny, 1986), one can end up saying that control as an independent variable causes sense of control as a dependent variable and is mediated by perceived control! A biopsychosocial model of control, utilizing a bidirectional system's feedback framework, can help refine where, why, and how control is conceptualized. Finally, one can also see from Figure 2 that different control-based psychotherapeutic and health care interventions can be utilized—directly and indirectly—to address control mismatches, negative health behaviors, mental and physical dysregulation, and maladaptive coping to physical illness depending on the individual's specific control profile (cf. Figure 1).

Values: The Goal of Control

Knowledge is knowing how, wisdom is knowing whether.

—Stephen Potter

To address the negative consequences of control, it is also necessary to posit values—the goal toward which control efforts should be directed (cf. Allport, 1955; Kanfer, 1979; Maslow, 1968). The philosophical assumptions and scientific paradigm (Kuhn, 1970) underlying psychological theory affect views on the extent to which values either can or should belong to the realm of psychological inquiry (cf. Kendler, 1993, 1994). Personal values require philosophical assumptions of consciousness (Baruss, 1990; Claxton, 1994; Tart, 1972, 1975; Walsh, 1980), the self (Sampson, 1985; Viney, 1969), and free will (Furlong, 1979; Howard & Conway, 1986). Such concepts are considered as epiphenomena, and hence outside the realm of legitimate scientific inquiry by radical behaviorists arguing environmental determinism and biological reductionists arguing genetic inheritance.

However, certain reciprocal and interactive models of causality (e.g., Bandura, 1978, 1986; Sperry, 1985, 1988) argue that cognitive mediation, conscious forethought, and proximal and distal goal setting are critical determinants of human action. For example, Sperry argued that biological determinism, which he called "control upward," is not sufficient to account for the current state of human evolution. Rather, as part of the cognitive and mentalist revolution (cf. Frank, 1977; Pribram, 1988), he posited that consciousness, values, goals, and purposiveness have more effect in determining the motion of molecules (control downward) than vice versa: "Values themselves exert powerful causal influences in brain function and behavior. . . . They're universal determinants in all human decision-making. . . . [They are] the most powerful causal control forces now shaping world events" (Sperry, 1985, p. 174; see also Sperry, 1993).

Without conscious examination of the goals of control, those goals will be determined by biological needs,

the techniques themselves, or unexamined cultural mores (Albee, 1986; Bergin, 1991; D. D. Campbell, 1975; Heath, 1983; Nolan, 1972; D. H. Shapiro, 1983c; Smith, 1961, 1982; Sperry, 1977; Tart, 1979; Woolfolk & Richardson, 1984). Because of the increase in people's collective ability to control the earth, atoms, other species, genes, and other people, they have unprecedented external control. However, many of the global problems people face today are caused by where and how they exercise their control and are based on their assumptions about their right to exercise such control.

Where and Why Do People Want Control?

Control efforts can be examined using Maslow's (1968) hierarchy of needs. Following this model, initial external control efforts are based on satisfying physiological needs of hunger and thirst, followed by safety needs of security and freedom from attack (cf. White, 1959). Self-control techniques are directed toward avoidance of pain and stress (cf. Fordyce, 1988) and food storage and delay of gratification (see Logue, 1988, for a discussion of Mischel's social learning theory, Herrnstein's matching law, and optimal foraging theory). At the next level of Maslow's hierarchy, psychological needs are met through successful control efforts—mastery and competence—for self-esteem and ego identity (cf. Erickson, 1959; Fromm, 1959; Taylor & Brown, 1994).

Am I My Brother's Keeper?

The next level of Maslow's (1968) needs is interpersonal belonging. However, ego needs can affect interpersonal needs, as the Biblical story of Cain and Abel illustrates (Genesis 4: 2–9). When God favored Abel's work product more than Cain's, Cain felt "much distressed." Why? One might infer that Cain felt a lack of control because the world did not appear just (his efforts were not rewarded) and thus there was no meaningful order and predictability (Antonovsky, 1979; Frankl, 1962/1980; Kelly, 1955; Lerner, 1975; May & Yalom, 1989). Furthermore, his self-competence and sense of self-efficacy were threatened (Bandura, 1977; Taylor & Brown, 1988; White, 1959). Cain was told by God to master his emotions. Did Cain practice deep breathing and use cognitive coping strategies to regain a sense of control; did he reframe and reappraise the situation in order to keep a perspective—retrospective control (Thompson, 1981), decisional control (Averill, 1973), and interpretive secondary control (Weisz et al., 1974)?

No. Instead, Cain killed Abel. One could say he exercised decisional and behavioral control (Averill, 1973), showing his freedom (Rodin, 1986) to exercise self-determination (Deci & Ryan, 1985) and choice (cf. Langer, 1983; Zimbardo, 1969) and freedom from being controlled (e.g., J. Brehm, 1966; S. S. Brehm & Brehm, 1991). Cain showed his competence by exerting social dominance in terms of power over the social environment (Adler, 1964; Glass, 1977; McClelland, 1961, 1975), just as he had earlier sought to exert control over the external

environment (Hendrick, 1942; Kardiner & Spiegel, 1947; Piaget, 1952).

In the parable, Cain symbolically killed half the human race in order to seek to regain a sense of control, based on a threat to his livelihood and his psychological needs. In many ways, humans individually and collectively are faced with contemporary questions about when to exercise self-control and when to attempt control over their social and physical world (Smith, 1965; Walsh, 1984). In affluent societies, self-control may need to be directed toward delay of gratification (Mischel, Ebbsen, & Zeiss, 1972). We additionally suggest (in what some may consider an equally culturally and politically bound view) that self-control efforts may also need to involve relinquishing culture's social and economic emphasis on the need for external acquisition as a sign of self-worth and self-competence (cf. Elgin, 1981). Furthermore, we believe that at some point the focus of control efforts must go beyond goals of personal competence, autonomous self-identity, and positive ego development (e.g., Walsh & Vaughan, 1994). Such control efforts should also be directed toward generativity, compassionate service for the healing of others, and interpersonal and collective well-being (Fowler, 1981; Kohlberg, 1981; Levinson et al., 1978; Maslow, 1968).

It has been argued that one of the greatest human fears is losing control (cf. J. Brehm, 1966; S. S. Brehm & Brehm, 1991; Druckman & Swets, 1988; Seligman, 1975, 1991; Wortman & Brehm, 1975) and that one of the strongest human motivations and most basic needs is to have control over one's life (cf. Bandura, 1977, 1989b; Burger & Cooper, 1979; Deci & Ryan, 1985; Rodin, 1986; Rothbaum & Weisz, 1989; D. H. Shapiro, in press; White, 1959). Historically, the species' control-related desires, goals, and strategies have been channeled both for the greatest human well-being as well as for profound personal, interpersonal, and societal destructiveness. A central task for psychological theory, research, and practice is to help people, both individually and collectively, learn where and when control goals, desires, and strategies are reflexive, limiting, and potentially destructive and to channel them in life-affirming and health-promoting ways. The quality of people's lives, the lives of those around them, and ultimately the well-being of the planet may, in large part, be determined by where and how people, as individuals and as a species, seek to gain and maintain a sense of control.

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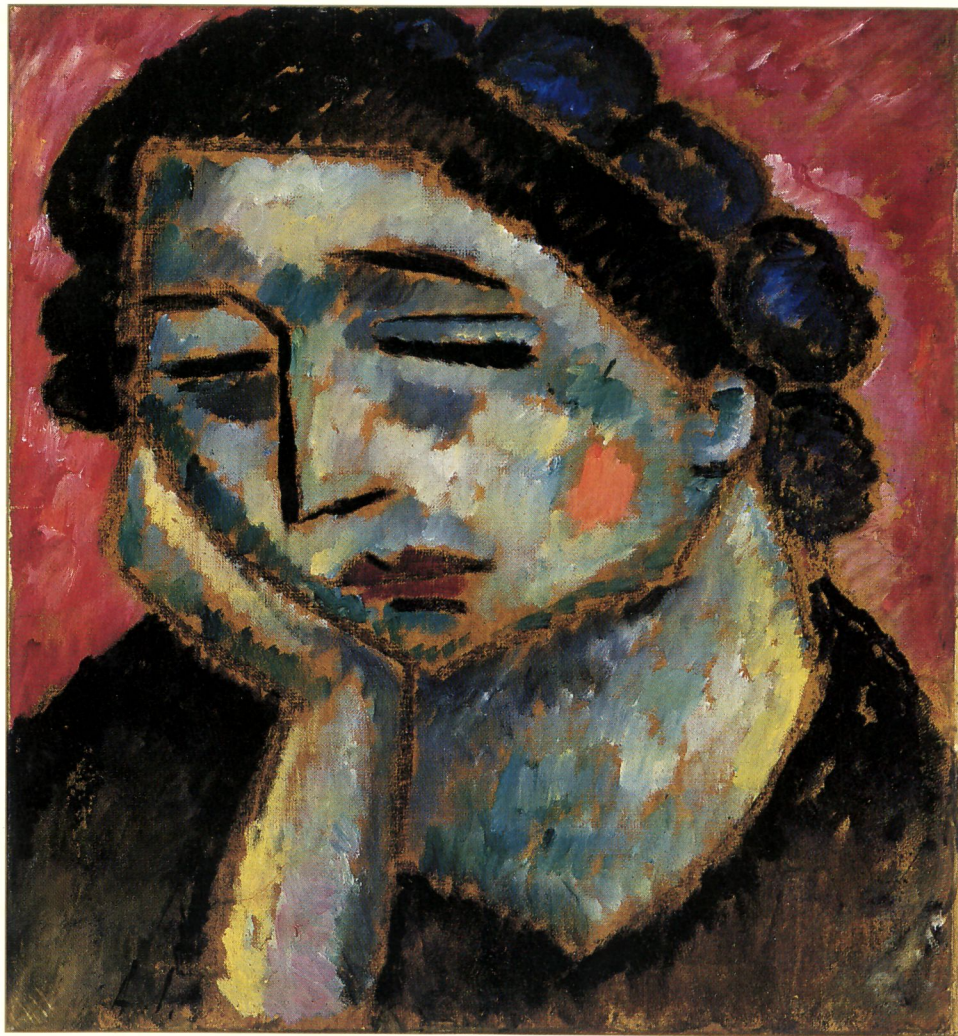
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AMERICAN PSYCHOLOGIST



Meditation

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