Aging, Culture and Control: Setting a New Research Agenda

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In the context of reviewing the current status of research on aging and control, we put forth five propositions: (1) Striving for primary control is a human universal invariant across historical time and diverse cultural settings; (2) the expression of control striving is in part shaped by culture; (3) the field needs to move away from the study of perceived control and its correlates to the study of motivational aspects of control; (4) control should be studied in a life span context and the focus should be on key transitions that redefine opportunities for control striving; and (5) inasmuch as primary control striving is such a central element of human functioning, research on its demise at the end of life should receive high priority.

The scope of control-related phenomena in human behavior is vast. Hundreds of descriptive and experimental studies have shown that control is related not only to a variety of mental and physical health outcomes, including survival, but also to many other psychological constructs, such as achievement, optimism, depression, persistence, coping, self-esteem, motivation, and personal adjustment (Skinner, 1996). Moreover, control is one of the few constructs that has been effectively applied to individuals of all ages, from infancy to old age, and has spawned comprehensive theories of development (Heckhausen & Schulz, 1995) as well as theories of successful aging (Schulz & Heckhausen, 1997). Finally, control has figured prominently in debates about the universality of psychological constructs across historical time and diverse cultures.

The abundance of empirical and theoretical work has also stimulated the proliferation of control-related constructs, including the differentiation of control into various subconstructs, such as agenda control, cognitive control, vicarious control, illusionary control, outcome control, primary and secondary control, decisional control, and predictive control. Additional terms closely related and sometimes conceptually identical to control include efficacy, helplessness, mastery, agency, effectance, self-determination, explanatory style, responsibility, blame, and outcome expectancy. Indeed, in her review of a decade of control literature published in the \textit{Journal of Personality and Social Psychology}, Skinner (1996) identified 100 different control-related constructs and cautioned that “the large number of terms has produced some theoretical confusion about the boundaries of the topic of control, about the interrelationships among constructs, and even about which constructs can be appropriately included in the study of control” (p. 550). One of the goals of this article is to clarify some of these boundaries. In addition, we focus on evolutionary and cultural perspectives on control in order to answer the questions, why is control such an important construct and what role does culture play in shaping individual motivation for and perceptions of control? As 1999 has been designated by the United Nations as the International Year of Older Persons, it is appropriate that we participate in the control and cultural variability debate (Antonucci, 1999). Next, we briefly review the two dominant research areas focused on aging and control: normative age changes in perceived control, and health and control in elderly adults. In the final sections of this article, we raise some key conceptual issues with regard to aging, culture, and control and provide recommendations for future research.

Evolutionary and Cultural Perspectives

White (1959) was the first investigator to suggest that striving for control has an evolutionary basis when he concluded that effectance motivation—striving for competence or mastery—is intrinsic to both humans and animals. Striving for control has advantages for all species that have the potential of influencing their environment. Controlling the environment is adaptive because it allows the organism to influence events relevant for survival, such as foraging, seeking and building shelter, searching for a mate, and caring for offspring. Human beings have been shaped by evolution to seek out, maintain, defend, and expand control by way of fundamental behavioral tendencies favoring active engagement with the environment. Such basic tendencies have been conceptualized as behavioral modules (Cosmides & Tooby, 1994; Fodor, 1983; Tooby & Cosmides, 1992), adaptive specializations (Rozin, 1976), or preadaptations (Mayr, 1960). Relevant modules for the promotion of control striving include: (1) preferences for behavior-event contingencies over event-event contingencies in mammals (White, 1959); (2) an enhanced readiness to repeat responses when they lead to desirable consequences ("law of effect," Thorndike, 1898; "operant conditioning," Skinner, 1938); (3) curiosity and novelty seeking behaviors among mammals (Schneider, 1996); and (4) an asymmetric affective system (see Appendix Note) that favors responding to negative affect and the spontaneous dissipation of positive affect (Frijda, 1988; Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1997). The emphasis on active engagement with the environment is consistent with our own theory of control in which we argue for the primacy of primary control—behaviors aimed at generating effects in the external world—over secondary control—behaviors and cognitions aimed at changing the internal world of the individual (Heckhausen & Schulz, 1995, 1999; Schulz & Heckhausen, 1996, 1997).
Humans share these fundamental behavioral tendencies across cultures and with many other species in the vertebrate strata. However, a major difference between humans and other organisms is that the behavioral program for control striving is relatively open or unconstrained for humans. The relative lack of biological and behavioral determinism means that human offspring need to be supported and nurtured for a long period of time during which development occurs. It also requires a motivational system that facilitates making choices among options and regulates behavioral investments accordingly.

Although control striving is clearly adaptive from an evolutionary perspective because it affords advantages for survival, procreation, and nurturing one’s offspring, one might question its relevance to middle and old age. A number of researchers have emphasized that evolution poses little selective pressure for adaptive development during postreproductive ages (Baltes, Lindenberger, & Staudinger, 1998; Crews, 1993; Finch, 1990). Indeed, some researchers have argued that evolutionary selection in humans most likely has favored various nonadaptive late-life onset byproducts of early onset adaptive characteristics. For example, developing resilience against life-threatening infectious diseases may have the side effect of rendering the individual vulnerable to Alzheimer’s disease in old age. In a similar fashion, heart disease among individuals with a Type A personality style may be a maladaptive midlife consequence of control striving strategies developed during the reproductive phase of development.

Once evolutionary selection sets into motion a characteristic that is adaptive for procreation, there are no selection mechanisms available for altering the program during the postreproductive years. In other words, there are no built-in mechanisms for turning off a characteristic, such as control striving, simply because the primary goal (e.g., procreation) for that characteristic is no longer relevant. Thus, we would argue that the fundamental motivational tendency to exert control is relatively constant over the life course and across cultures, but the plasticity of humans enables them to focus their control striving on varying goals, depending on their location in the life course.

An important implication of our view concerning the evolutionary origins of control is the idea that striving for control is a human universal invariant across historical time and diverse cultural settings. This is not to say that there are no cultural variations in the expression of control striving and in the extent to which different cultures afford opportunities for achieving control. Nevertheless, the preference for primary control is a fundamental human universal.

This position was recently challenged by Gould (in press), who criticized Heckhausen and Schulz (1995) for their universalist stance regarding the primacy of primary control and argued that some Eastern cultures value accommodative or secondary control strategies more than primary control striving. He claims that in much of Asia, secondary control takes on primacy, and he cites the work of Azuma (1984) and Weisz, Rothbaum, and Blackburn (1984) on cultural differences in views of primary and secondary control to support his position. In particular, he notes that in Japan “people favor secondary control over primary control, and that such control is viewed as a higher order concept,” and therefore any theory, “such as Heckhausen and Schulz’s, based on the foregrounding of primary control, must be suspect when applied to Japanese culture and likely other Asian cultures as well.”

We stand by our original universalist position, although we would readily acknowledge that there are cultural variations in the opportunities to engage in primary control and in the endorsement of primary and secondary control strategies. For example, in some Asian cultures, primary control striving is framed as a collectivist enterprise rather than as a goal of an individual. What Gould and others fail to appreciate is the distinction between control striving as an evolutionary-based, hardwired process and the manifestation of control-related behaviors, which are influenced by experience, learning, and culture (see Park, Nisbett, and Hedden, 1999, for a discussion of the same issues applied to culture and cognition). From our perspective, primary control striving is part of the hardwired core of the organism that shapes its development and determines its long-term survival. In organisms with high levels of plasticity, such as humans, secondary control processes are important, but only because they are needed to support primary control striving. Culture, prior experience, and genetic endowment play important roles in shaping both the types and quantities of primary control achieved by either facilitating or hindering development in specific domains. To take an extreme example, control striving in totalitarian societies is typically highly regulated and these constraints are often endorsed by the populace, but we would not interpret such “preferences” as indicative of a fundamental human motive with respect to control striving. Indeed, when people are allowed to vote with their feet, as reflected in voluntary migration patterns around the world, they invariably gravitate toward settings that foster primary control. Should we be interested in cultural and historical variations in control? Absolutely. Inasmuch as the history of the world is also a story about control, and the domination of one cultural group over another, we should study how and why societies regulate control strategies and evaluate the consequences of doing so.

Current Research on Aging and Control
Research on aging and control has been popular since the 1970s and has experienced a resurgence in recent years. Most of the existing research falls into one of two research areas: normative age changes in perceptions of control, and the relation between control and a variety of functional outcomes, such as health and cognition, that are important in middle and old age. A third emergent area, represented by the work of Heckhausen and colleagues (Heckhausen, 1999; Wrosch & Heckhausen, in press-a, in press-b) and Thompson and colleagues (1998), focuses on the role of control processes in life course development and is briefly discussed in the section on future directions.

Normative age changes in control.—In our 1991 review of the literature on age differences in self-reports of control, we concluded that there was little support for the idea that generalized control beliefs change with advancing age (Schulz, Heckhausen, & Locher, 1991). General internal control remained unaffected by age, while external control increased with respect to certain specific domains, such as intellectual functioning and health. A number of recent studies challenge these earlier findings (Gatz & Karel, 1993; Mirowsky, 1995, 1997; Wolinsky & Stump, 1996). Mirowsky (1995) found decreases in perceived control in the age range 18–50, even after controlling for education and physical impairment, which accounted for some of the association between age and perceived control.
Wolinsky and Stump (1996) replicated and extended these findings by demonstrating a similar pattern of results for a sample of older persons over the age of 50. Gatz and Karel (1993) studied personal control in four generations of families participating in a longitudinal study spanning 1971–1991. Longitudinal analysis showed greater internality over 20 years, but this could be attributed to changing contextual factors as well as developmental change. The most consistently external subgroup was the oldest generation of women. In contrast, Lachman and Weaver (1998) found no age differences in a general sense of mastery, although older adults scored higher on personal constraints than middle-aged and younger adults. For control over life overall, older adults reported significantly more control than younger or middle-aged adults. For the domain-specific control measures, age-related increases were found for control over work, finances, and marriage, whereas decreases were found for control over relationships with children and sex life.

The complex pattern of results reported above brings to mind Skinner's (1996) admonition about the need for conceptual clarity in defining and measuring control. The range of measures used in control studies may include single items and existing standardized scales, as well as ad hoc or theoretically derived combinations of questions borrowed from existing instruments. Given the many distinctions that have been made with respect to the conceptualization and measurement of control, it is critical that researchers understand which aspect of control they are focusing on. Having said this, there are still some clearly discernable patterns in the published literature. Overall, there appears to be some decline in generalized perceptions of control, at least in late life, and multiple studies yield age-related declines in specific domains of control. These studies also provide clues about antecedents of control (e.g., gender, education) and factors in addition to age that might contribute to declines in control (e.g., health, impairment). Identifying how and why a sense of control is eroded in late life should be of particular interest to gerontologists around the world. In thinking about this question, though, the focus should be shifted away from simply examining changes in perceived control to an emphasis on changes in motivation for control with attention paid to variance or invariance across cultures. This requires different conceptual and measurement strategies than those currently used by researchers. We elaborate more on this recommendation in a later section of this article.

Control and health. — Research on aging and control was stimulated initially by the assumption that some of the negative psychological and physical health effects observed among elderly individuals are attributable to reduced opportunities to exercise control in important life domains (Langer & Rodin, 1976; Rodin & Langer, 1977; Schulz, 1976; Schulz & Hanusa, 1978, 1979). This basic hypothesis was tested in a number of field experiments, which showed that a variety of interventions designed to increase control had a positive impact on health-related outcomes. Shortly after the emergence of experimental intervention research on aging and control, there appeared conceptually related studies anchored in the survey research tradition. This approach was exemplified by the work of researchers such as Krause (1986, 1987, 1998), Krause, Bennet, and Van-Tran (1989), Krause and Van-Tran (1989), and Siegler and Gatz (1985), in which large sample data were examined in order to identify age-related differences in perceptions of control and their relation to health outcomes. A third research tradition can be described as quasi-experimental in that it sought to identify the health-related effects of naturally occurring environmental circumstances (e.g., relocation, Schulz & Brenner, 1977; institutional environments, Timko & Moos, 1989) or historical events (e.g., the Depression, Elder, 1985) that are conceptually related to control. All of these research traditions have flourished in the 1990s, so much so that a comprehensive review of the control health literature would be a formidable task.

A brief sampling of some of the recent work on health and control is presented below, organized in terms of three general conceptual and analytic approaches to this topic. The three types of models tested include main effects, moderator, and mediator.

The main effects model argues that individuals with a strong sense of control will, even in the absence of stressors, maintain a higher level of well-being. For example Menec and Chipperfield (1997b) found that elderly individuals with high internal locus of control were more likely to exercise and engage in leisure activities, and these factors were, in turn, related to better perceived health. An innovative study by Eizemenn, Nesselroade, Featherman and Rowe (1997) showed that mean levels of locus of control and perceived competence did not predict 5-year mortality, but individual differences in the magnitude of week-to-week variability did predict mortality. This study raises provocative questions about mechanisms that might account for the observed association between mortality and variability in perceived control, as well as suggesting new measurement approaches to the assessment of control.

The moderator or stress-buffering model argues that control can dampen or mitigate the effects of potential stressors, but only if a stressor is present. Many studies of control and health fall into this category. For example, using data from the Aging in Manitoba Study, Chipperfield (1993) shows that perceived control over health care and inability to manage health predicts 12-year mortality, but only among individuals whose health is compromised to begin with. More recently, Menec and Chipperfield (1997b) found that perceived control was associated with perceived health among old-old adults with some functional impairment, but only among those with little functional impairment. However, a greater sense of control was associated with lower rates of hospitalization and mortality for old-old individuals with little functional impairment. Even more complex interactions can be found in studies focused on individuals experiencing specific health challenges, such as rheumatoid arthritis (e.g., Reich, Zautra, & Manne, 1993).

A third model treats control as mediator between a predictor variable and a health-related outcome. For example, Herzog, Franks, Markus, and Holmberg (1998) found that the frequency of performing both leisure and productive activities is related to physical health and depression, and that these effects are mediated in part by a sense of self as agent. Intervention studies aimed at improving the health and functioning of older individuals frequently identify self-efficacy as the mediating mechanism through which positive outcomes are achieved (Bandura, 1997).

With the exception of a few studies that focus on unique and unusual circumstances (e.g. Rodin, Rennert, & Solomon, 1980; Thompson, 1981), the overriding picture that emerges from this literature is that having control is good for one's health and not
having it can be bad. To the degree that cross-cultural data are available, this finding also appears valid across cultures. The consistency of findings in this literature is remarkable given the varied ways in which control is measured or manipulated. However, identifying specific physiological factors that link control to health has been difficult. Physiological mechanisms investigated in both young and old individuals include the pituitary-adrenal axis, the sympathetic nervous system, and the immune system. The ultimate goal of these research efforts is to illuminate complex mind-body connections and demonstrate the role of control as a biological modulator (Haidt & Rodin, 1995). Investigating control-related physiological mechanisms in the elderly population is doubly challenging because one must have a good understanding of normative age changes in both the psychology of control and the physiology of key biological systems in order to interpret findings from these research endeavors. Technological advances in the measurement of biological markers during the past decade make it feasible to reach this goal.

**Conceptual Issues: Distinguishing Between Perceived Control and Control-Related Behaviors**

Specific definitions of and distinctions among control-related constructs are thoroughly discussed in two recent reviews (Haidt & Rodin, 1995; Skinner, 1996) and will not be covered here. The report by Haidt and Rodin also includes the major measurement tools available for assessing control. Our goal here is to highlight several key conceptual issues that we believe are useful in shaping the future international research agenda on aging and control.

Most researchers working in the area of control would acknowledge that the construct of control encompasses multiple processes, functions, and behaviors, some of which are captured by measures of perceived control. Yet, much of the research is focused exclusively on perceived control. In many cases, control-related behaviors do not necessarily involve and certainly are not captured by measures aimed at assessing beliefs about control. People across ages, situations, countries, and cultures strive to influence events in their environments regardless of whether they have high or low estimates of personal control; given a strong need or desire, low control beliefs will not necessarily deter control attempts, and conversely, high control beliefs will not guarantee control striving.

If our goal is to understand control-related behaviors and their relation to constructs, such as perceived control, it is important that we first discriminate between two distinct targets of behavior and cognitions: the external world around us and the internal world that is made up of the perceptions, cognitions, and emotions that reside within us. We use the term *primary control* to describe behaviors aimed at generating effects in the external world and the term *secondary control* to describe behaviors and cognitions aimed at changing the internal world (e.g., cognitions) of the individual. To elaborate further, primary control strategies are defined as the means by which an individual attempts to produce behavior-event contingencies. Long-term primary control potential refers to the capacity of the individual to produce desired outcomes on a long-term basis, typically encompassing the entire life span. This capacity comprises both behavioral (e.g., abilities, skills) and motivational (e.g., self-esteem, perceived control) resources of the individual. The major function of secondary control is to effect cognitive changes within the individual, particularly those related to motivational and emotional processes that serve as a resource for primary control. Thus, we define secondary control as individuals’ abilities to shape their own emotions, motivational states, and cognitions about themselves and the world around them. Secondary control is a confederate of primary control, which serves to preserve the motivational resources for primary control striving.

What are the implications of these distinctions? It should be clear from this discussion that perceived control when placed in this context is only a small piece of the control puzzle. Perceived control serves as a moderator between the objective control potential in the environment and the individual’s primary control striving. To the extent that individuals are aware of opportunities to control the environment with respect to a particular goal or outcome, regardless of individual and cultural variations, they are likely to strive for such outcomes. In addition, perceived control is one of many strategies that facilitates primary control striving in that it can serve as a motivational resource for achieving primary control goals. Thus, individuals who have high levels of perceived control should be more likely to pursue and achieve goals related to those control beliefs. But perceived control is not the only factor that serves these ends. Other strategies that play a similar role include enhancing the value of a desired goal or devaluing competing goals. Each of these can be influenced by individual, community or cultural characteristics.

A second implication concerns the life span trajectories of different control processes (see Figure 1). Because primary control is determined by the biological development and age-related decline of the individual and the sociocultural opportunities afforded by society, it has an inverted u-shaped function when plotted against age. Primary control increases rapidly in infancy and early childhood and continues to increase at a more moderate pace throughout adolescence and early adulthood. Sometime in midlife, primary control becomes asymptotic—that is, processes of growth and decline are balanced. In advanced adulthood and old age, primary control can be expected

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**Figure 1. Hypothetical life span trajectories of primary control striving, primary control capacity, and use of secondary control process.** (From R. Schulz & J. Heckhausen [1996]. A life span model of successful aging. *American Psychologist, 51*, 702–714. Copyright © 1996 by the American Psychological Association. Adapted with permission.)
to decline, moderately at first, and more radically toward the end of life.

The use of secondary control strategies follows a trajectory of increase throughout childhood and adolescence, after first becoming developmentally available in mid-childhood (e.g., Altschuler & Ruble, 1989; Band & Weisz, 1988, 1990; see review in Heckhausen & Schulz, 1995). During midlife and old age, secondary control strategies, which are also influenced by individual, community, and cultural characteristics, are used increasingly to cope with the losses in primary control experienced at older ages. These losses in primary control need to be compensated for by secondary control strategies in order to maintain the overall motivational resources for primary control striving. Finally, as shown in Figure 1, striving for primary control remains stable throughout the life span, although the specific goals for primary control striving will vary depending on the individual's location in the life course (e.g., giving up career goals in late midlife). Thus, the target or goal of control striving will vary as a function of age-related, contextual and cultural opportunities for achieving control, but striving for control will remain constant. It is only under conditions of severe, general, and irreversible losses or declines that the control system collapses, leaving the individual with few behavioral and motivational resources for primary control striving.

**Future Directions**

Research need not be a zero-sum game where a focus on one area requires that we give up another. Yet, if we had to give up something in the control area in order to make room for other approaches, it would be the least exclusive focus on perceived control. The marginal utility to the field is small of yet another study showing how some measure of perceived control mediates, moderates, is predicted by, or varies as a function of x. This is not to say that we would give up on this construct altogether, because it can play an important role as a manipulation check in experimental studies, an essential element in a more elaborate conceptual framework, or as a key element in testing models of mind-body linkages. When perceived control is measured, we should follow Skinner's advice and consider which aspect of control (e.g., effectiveness of action means, or personal capacity for control) is most relevant to our goals and then choose an appropriate measure. This latter step frequently receives only brief attention in many studies on aging and control.

Our own proclivity is to move the field toward motivation-action research, with a special sensitivity to the role of individual, environmental, and cultural influences on both motivation and action choices. The central question within this perspective is how do individuals use primary and secondary control to meet the dual challenges of selectivity and failure compensation as experienced in specific cultural environments throughout the life course with its numerous transitions in opportunities for control? In our life span model of successful development and aging (Schulz & Heckhausen, 1996), we have described selective and compensatory primary and secondary control strategies aimed at maximizing the potential for primary control throughout the life course. Testing this model requires that we develop measurement strategies that focus on the use of control-related strategies rather than perceived control per se (Heckhausen, 1999; Heckhausen, Schulz, & Wrosch, 1998; Schulz, Wrosch, Yee, & Heckhausen, 1999; Wrosch & Heckhausen, in press-b). An important advantage of our approach is that it enables us to predict action cycles of goal engagement and disengagement to include individual, community and cultural influences, and thus to identify a priori adaptive and maladaptive control strategies. Action cycles are defined as major life transitions that redefine opportunities for control striving. Examples include loss of fertility associated with menopause (Heckhausen, Wrosch, & Fleeson, 1998), age-related changes in health and functional status (Schulz et al., 1999), and losing an intimate partner (Wrosch & Heckhausen, in press-a). Each of these transitions is characterized by motivational engagement prior to the transition point (e.g., increased effort to become pregnant among childless couples as they age), each can be influenced by norms and expectations (e.g., the one child–family norm in China would make secondary infertility less difficult regardless of personal choice) and disengagement after the deadline is passed (e.g., life without children has its advantages). Successful adaptation to these transitions requires the application of primary and secondary control strategies that take into account the shift in goal orientation required by these transitions, which are often influenced by life cycle status and cultural milieu.

In the context of exploring the potential of the human control system, research on extreme circumstances that result in the breakdown of the control system should be particularly promising. For example, many older individuals progress through stages of pathology, impairment, and disability before they die. What role do compensation processes play in these transitions, and how effective are they in dealing with these threats? How does culture influence these processes? Under what circumstances do individuals give up primary control striving, and what are the health consequences of relinquishing primary control?

Finally, because control-related processes are so central to the physical health and psychological well-being of all human beings in all cultures, it is useful to emphasize once again the importance of identifying behavioral and biological links between control and psychiatric and physical morbidity. This is particularly important for those of us interested in aging, because late life entails critical transitions in both control processes and health and well-being.

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Appendix

Note

The affect system in humans has evolved to protect them from the dangers of positive affect serving as the ultimate goal of human existence. Positive emotions are contingent on change and disappear relatively quickly with the passage of time, whereas negative emotions persist as long as the instigating conditions are present: “One gets used to the events that, earlier, delighted and caused joy; one does not get used to continuous harassment or humiliation. Fear can go on forever; hopes have limited duration” (Frijda, 1988, pp. 353–354). The link between change and positive affect is consistent with our idea of the primacy of primary control. It ensures that individuals continue striving beyond already attained levels of primary control, and the only way to achieve this is through action on the external environment. From an evolutionary perspective, an asymmetric affective system that requires continuous change for maintaining positive affect and heightened responsiveness to adverse conditions and the associated negative affect is likely to promote survival by way of maximizing primary control.


