Seven Guideposts to the Study of Perceived Control Across the Lifespan

ELLEN A. SKINNER

When Julian Rotter wrote his now-classic paper on “Generalized Expectancies for Internal versus External Control of Reinforcement” in 1966, he could scarcely have imagined the ensuing tsunami of research that would wash across all of psychology, uncovering the powerful effects of perceived control during every period of the lifespan in multiple life domains and across many cultures (e.g., Cheng, Cheung, Chio, & Chan, 2013). This rising tide was helped along by contemporaries who were studying locus of control in children (Crandall, Katkovsky, & Crandall, 1965) and adults (Lefcourt, 1966), and by other experts in the field who, a decade later, published their key treatises on learned helplessness (Abramson, Seligman, & Teasdale, 1978; Seligman, 1975), self-efficacy (Bandura, 1977), and causal attributions (Weiner, 1979). These theories and their associated constructs helped reshape research and interventions across the social sciences, including in the areas of health (e.g., Ashford, Edmunds, & French, 2010), motivation (e.g., Graham & Williams, 2009),
education (e.g., Schunk & Mullen, 2012), psychopathology (e.g., Gallagher, Bentley, & Barlow, 2014), coping (e.g., Aldwin, 2007), work (e.g., Brown, 2012), parenting (e.g., Clement, Wilkinson, Vimpani, & Reynolds, 2003), and aging (e.g., Baltes & Baltes, 2014).

Taken together, these conceptual and empirical efforts comprise tens of thousands of studies documenting the astonishing power of perceived control: It is one of the most robust influences on whether individuals and groups will take initiative, exert effort, and persist, especially in the face of challenges and obstacles (Weiner, 2010); it is an essential moderator of the effects of stressful experiences, and how people deal with and rebound from hardship (e.g., Folkman, 1984); it is one of the most robust predictors of school achievement and completion of high school and college (e.g., Usher & Pajares, 2008); and it is a decisive factor in whether patients will comply with regimens prescribed to sustain their mental and physical health and so recover from acute and chronic medical conditions (e.g., Korpershoek, van der Bijl, & Hafsteinsdóttir, 2011). In general, when people perceive that they have a high degree of control, they exert effort, try hard, initiate action, and persist in the face of failures and setbacks; they evince interest, optimism, sustained attention, problem solving, and an action orientation. When people believe that control is impossible, they withdraw, retreat, escape, give up, or otherwise become passive; they become fearful, depressed, pessimistic, and distressed. In every suite of measures designed to identify social and psychological factors that forecast well-being, thriving, and resilience, research repeatedly accords perceived control a central place among the top predictors.

Perhaps such a productive and exuberant area of research, fed from so many different theoretical and empirical streams, can be forgiven some of the confusion that marked its heyday in the 1980s and 1990s, when more than 100 different control-related construct terms were in circulation (Chanowitz & Langer, 1980; Rodin, 1990; Skinner, 1996; Thompson & Spacapan, 1991). Since that time, it has become standard practice to insert measures of perceived control into studies exploring the predictors of mental and physical functioning and well-being. In fact, it has become so commonplace that it sometimes seems that these measures have
become unmoored from their conceptual foundations and are simply acting as placeholders for a general positive mental state. The goal of this chapter is to pull together some of the lessons learned from five decades of research on perceived control in order to secure these constructs more firmly to their conceptual anchors (Lefcourt, 1982, 1992; Strickland, 1989). These lessons, enumerated in Box 13.1, include the nature of perceived control and its essential features and origins, as well as its mechanisms of effects, dynamics, development, and the inherent limitations of theories of control. The 50th anniversary of a seminal publication in the field is an apt occasion to revisit the roots of constructs of control in order to ensure not only the durability of these constructs, but also to preserve

Box 13.1

SEVEN GUIDEPOSTS TO THE STUDY OF PERCEIVED CONTROL
ACROSS THE LIFESPAN

1. Perceived control is more than a perception and less than a personality trait; it is an internal working model of apparent reality.
2. The motivational core of perceived control is the need for competence and the experience of generative transmission.
3. Perceived control exerts its effects through motivational, emotional, cognitive, volitional, and neurophysiological mechanisms.
4. Perceived control is constructed and updated based on interactions with the physical and social world.
5. Because of its feed-forward and feedback effects, perceived control participates in recursive dynamics that can verify and amplify its conclusions over time.
6. Perceived control develops throughout the Lifespan, starting with neonates’ early detection of contingency and sensitive responsiveness.
7. Perceived control is not the only (or the most important) psychological need.
their richness and complexity, so that work in this area may continue to flourish for many decades to come.

SEVEN LESSONS LEARNED

1. Perceived control is more than a perception and less than a personality trait; it is an internal working model of apparent reality.

Because work on control arose from many different theoretical traditions, it has been conceptualized alternatively as a situation specific perception, an appraisal, an expectation, a generalized expectancy, a causal attribution, an estimate of contingency, an explanatory style, a cognitive construction, a self-system process, and a personality trait. The first lesson learned about perceived control (and all its cognate constructs, like locus of control or self-efficacy) is that it is probably best represented as a naïve internal working model constructed by an individual to map the potentials for control. This map is a cognitive construction built on implicit expectancies grounded in experiences, but it is not composed of “cool” cognitions about statistical probabilities and procedural rules. It comprises emotionally and motivationally “hot” convictions about one’s personal force, that create an “apparent reality” (Fridja, 1988) full of threats, dangers, challenges, or opportunities to realize one’s desired outcomes and to ward off or terminate undesired outcomes.

Perceived control is a complex multi-level system that integrates the many components of control proper that have been identified by researchers over the years. As explained by Lefcourt in 1992:

Although the authors of these various cognate constructs insist on the uniqueness of their contributions, and draw detailed definitions to disentangle theirs from the terminologies of others, it is evident that there is much overlap in the meanings that are dealt with under these diverse rubrics. Though the foci of certain constructs emphasize the situational determinants of causal beliefs and others are cast more in motivational than in expectancy terminology, there is
enough commonality among these constructs to have allowed researchers to be stimulated by the convergent findings obtained with their widely divergent methodologies, and it is perhaps due to such convergence that this area of concern has evinced such longevity. (pp. 412–413)

At the outside tip of this system are situation-specific appraisals of “personal control,” informing an individual about whether she finds herself in a situation where her actions can be effective in realizing her goals. These appraisals (referred to as perceived control, self-efficacy, expectancies of success, and so on) are an essential contributor to action readiness, and they guide subsequent choice, initiative, effort, strategy selection, and persistence. The actions that the competence system urges, when expressed in a specific context, create an experience of control—that is, of the effectiveness (or ineffectiveness) of that action in producing its desired outcome. In the specific situation, this feedback is interpreted and can lead to reappraisals of control that continue to guide subsequent actions, including decisions to exert more effort, disengage, or withdraw.

Underneath this surface layer of situation-specific appraisals of control are a set of assumptive understandings about control that participate (along with specific information about the particular internal and external conditions of action) in the construction of these changing and dynamic moment-to-moment appraisals. This underground machinery, which also appears to be programmed into neurophysiological systems (Maier, 2015), has sometimes been described by researchers as a “style,” as in attributional style, explanatory style, or personality style. These assumptive understandings seem to be organized around three themes: (1) causality or contingency; (2) competence; and (3) control.

Contingency. The theme of causality or contingency refers to beliefs about the causal structure of the world (or domain or situation)—that is, the kinds of causes that are likely to be effective in producing desired and preventing undesired outcomes. The usual suspects include causes that are internal (effort, ability), external (task difficulty, powerful others, bureaucratic systems), impersonal (luck, chance, fate), and unknown.
These have been specified and studied by researchers who focus on locus of control, attributions, causal explanations, action–outcome expectancies, universal helplessness, and means–ends or strategy beliefs. These researchers agree that people’s causal appraisals and explanations act as filters that fundamentally shape their control experiences. However, investigators continue to argue about the active ingredients responsible for the emotional and behavioral effects of causal beliefs; specifically, about the particular dimensions that underlie these causal categories (e.g., their internality, controllability, stability, and globality).

The queen of all causes seems to be our own actions or efforts. Because individuals have the potential to intentionally deploy, empower, and augment them, these are considered the source of our personal force. Hence, some researchers have argued that it is contingency beliefs (i.e., beliefs about whether or not contingencies exist between our actions and desired outcomes) that are the first among equals in the causal hierarchy. From this perspective, beliefs about the involvement of all the other causes are important only to the extent that they shed light on this central question—that is, external locus of control is important because it implies that contingencies between actions and outcomes are low, or an attribution of failure to ability is important because it implies that actions will not be effective.

An important message from research on causal explanations is that, although dimensions (like internal and external) are bipolar, beliefs about causal categories are not (e.g., Connell, 1985). That is, just because someone believes that external forces, like powerful others, are important, it does not necessarily follow that they believe that internal factors, like effort, are not. Working models of contingency and causality are probably best considered as a profile of convictions about the balance of causal forces at work in creating outcomes, focusing especially on whether individual actions play a central role in that mix or are eclipsed by external or uncontrollable factors.

Competence. The next theme, namely, that of competence, suggests an important complement to one’s internal working model of the reigning causal order. Specifically, these assumptive understandings focus on
whether an individual believes that he or she has access to the causes that are effective in producing desired or preventing undesired outcomes. Because the queen of causes entails actions or efforts, the queen of competencies refers to whether or not one can produce effective responses; these beliefs have most typically been labeled “self-efficacy,” but they have also been studied as perceived competence, perceived ability, agency or capacity beliefs, and personal helplessness. At the same time, however, an individual can have access to categories of causes other than actions—for example, they can believe that they possess high ability, can influence powerful others, or are lucky. If individuals believe that they have access to and can influence “external” factors, many of the problems typically caused by beliefs in external causes can be mitigated, and, in fact, a belief in the importance of powerful others, if these others are seen as benevolent, responsive, and acting on the individual’s behalf, can actually augment a sense of personal control (Antonovsky, 1979).

Corresponding to the notion that beliefs about causes are loosely organized to create a causal hierarchy with contingency at its apex, so, too, can beliefs about competence be usefully conceived of as a repertoire of capacities that have effective actions at the apex. It is as if beliefs about causality represent a range of keys on the causal “piano,” and beliefs about competence represent one’s confidence in being able to play (or operate) those keys when needed. Although action–outcome contingencies and competence to enact effective responses are the central themes in the overall concerto of control (Bandura, 1977), the wider the range of keys and the more keys one can play, the greater one’s repertoire of control strategies and capacities, and so the greater one’s overall potential to exercise control.

Control. Despite the multitude of constructs hovering around the concept of control, the essential elements of perceived control are relatively straightforward. The prototypical question of control is “Can I influence this important outcome in the direction of my choice?” In terms of contingency and competence, this can be restated as “Do I have the capacity to produce the actions that are effective in operating existing contingencies?” (or, in everyday language, “Do I have what it takes to get what
I want?”). As can be imagined, if both contingency and competence are necessary conditions for the expectation of control, then the absence of either one would be a sufficient condition for its loss. So any kind of non-contingency (e.g., because outcomes are based on uncontrollable causes, like powerful others, luck, or chance, or are simply unknown) or any kind of incompetence (e.g., based on perceived lack of will or ability or access to other causes) should undermine control. By the same token, sources of contingency and competence spread out over many agents and means can pile up to create a stronger sense of “personal force” or control. It is important to note that the belief systems underlying control are not rational declarative systems in which contingency and competence are cleanly added or multiplied to yield precise estimates of control. Instead, beliefs are loosely coupled, and generally related as would be expected, with high competence and contingency typically connected to a higher sense of control but not always integrated in the ways logic would dictate (e.g., Skinner, Zimmer-Gembeck, & Connell, 1998).

*Complex system.* Hence, the system is complex, multi-leveled, and dynamic. Any attempt to assert that one theory of control (no matter how elegant) would be sufficient to depict the entire system will inevitably lead to an impoverished or truncated appreciation of its organization and functioning. Since the absence of either contingency or competence leads to the loss of control, any single set of beliefs can be sufficient to undermine control and produce helplessness. However, if researchers are interested in promoting a sense of control, then it would be important to attend to all of the system’s elements—because each offers a window into a source of potential problems as well as into a source of potential remedies for improving this complex system.

When trying to characterize the whole system, it is also important to note two additional features around which much argument has swirled, namely, the level of specificity and the time course of perceived control. *Level of specificity* refers to whether perceptions of control focus on a situation-specific response, a set of responses in similar situations, a domain of outcomes, or a general pan-domain belief system (Rotter, 1975). *Time course* refers to whether perceptions of control summarize past experiences (e.g.,
retrospective control or causal attributions) or are projected into future experiences (e.g., prospective control or causal expectancies). These distinctions are important for making sense of the scope, strength, and mechanisms of effects. As would be expected, the more situation-specific the beliefs, the stronger their effects on situation-specific outcomes and the smaller the scope of their effects across domains; conversely, the more general the beliefs, the wider the range of their effects and the smaller their effects in particular situations. In terms of time course, expectancies about the future are the proximal triggers of action initiation and persistence, whereas retrospective reconstructions are the filters through which experiences derive their meaning for future encounters.

If complex working models organized around themes of control, contingency, and competence are conceived in systems terms, then it becomes clear that these beliefs are not stored as a fixed library of declarative statements. Instead, they may be better thought of as a simmering brew of hot lived experiences, connected by networks of implicit assumptions that are successively organized into more or less explicit islands that comprise the contours of convictions about control. When called upon by the appraisal of threats or opportunities for control in specific situations, this system (in combination with many others) helps to assemble goals and action readiness that shape all the effects of perceived control that have been so well-documented.

2. The motivational core of perceived control is the need for competence and the experience of generative transmission.

One of the reasons cited for the enduring interest of social scientists in constructs of control is that they seem to mark a place where multiple research traditions converge on a fundamental human concern (Brim, 1992; Lefcourt, 1992). Although these questions have been of interest to philosophers, playwrights, and other students of human nature for many centuries, it was Robert White who, in 1959, brought the essential issue to the field in his now classic paper entitled, “Motivation Reconsidered: The Concept of Competence.” Reviewing sources of evidence from multiple areas of research (including animal behavior, child development,
cognitive psychology, psychoanalytic ego psychology, and the psychology of personality), the central argument White formulated was that, counter to the prevailing movements of behaviorism and Freudian psychology, all humans come with fundamental psychological needs, in this case, with the need for competence.

This innate need, comprising the desire to be effective in one’s interactions with the social and physical environment, motivates and energizes humans from birth to search for and to be attracted to opportunities to make things happen—to be motivated to try out their actions with the goal of creating new and interesting sights, sounds, and other effects; to persist in these efforts in the face of obstacles and challenges; to find this process interesting and fun; and to experience joy when these efforts succeed and dejection when they fail. This motivation is posited to account for the predilection of humans (and many other species) to be curious, to be attracted to novelty, to explore and experiment, to engage with the environment, and basically to insist on figuring out how things work—for the sake of the process itself, that is, based on the joy of exercise and discovery even when no other reward or outcome is forthcoming.

This energetic force is sometimes simply called intrinsic motivation, but it is probably better referred to as effectance (White, 1959), competence (Elliot, McGregor, & Thrash, 2002), or mastery (Harter, 1981) motivation, since it seems likely that there are additional intrinsic motives guided by needs other than competence (Baumeister & Leary, 1995; Deci & Ryan, 1985). Although intrinsic motivations are difficult to verify empirically, one indication of their functioning can be found in newborns, who seem to arrive with the capacity and will to detect contingencies between their actions and potential effects in the environment (Rovee-Collier & Cuevas, 2009). Sometimes called statistical learning (and basic to both classical and operant conditioning), evidence suggests that newborns have the cognitive capacity (using implicit sensorimotor intelligence) to construct generalized expectations of contingencies, perhaps as early as 8–10 weeks of age (Frankenhuis, Gergely, & Watson, 2013; Rovee-Collier, 1999; Sodian, 2011) or even earlier (Sherman, Rice, & Cassidy, 2015). Infants seem primed to attend to specific kinds of contingencies, namely,
those from interactions that are emotional, social, and connected to infants’ own signals and actions (Sherman et al., 2015). Compared, for example, to emotionally neutral object-related “event–event” contingencies, infants prioritize, remember, and act on “hot” action–event contingencies (Frankenhuis et al., 2013)—which are exactly the kind that are relevant to control.

Experiences of control. In general, such interactions can be called experiences of control, or experiences of effectance, competence, mastery, or personal force. As I have tried to explain in my earlier writings (Skinner, 1996):

As opposed to actual conditions (objective control) or beliefs (subjective control), the experience of control refers to a person’s feelings as he or she is interacting with the environment while attempting to produce a desired or prevent an undesired outcome. For example, Chanowitz and Langer (1980) distinguished between the description of exercised control (“I can do it”) and the experience of exercising control (“I am making it happen”). Experiences of control are products of external conditions (e.g., the degree of contingency between actions and outcomes), subjective interpretations (whether a success is believed to indicate ability or luck; Alloy & Tabachnik, 1984), and individual actions (Chanowitz & Langer, 1980; Skinner, 1985). Prototypical experiences of this sort are referred to in the literature on causal reasoning as “generative transmission” (Shultz, Fisher, Pratt, & Rulf, 1986), in which an individual intentionally exerts effort toward a goal and can feel the energy of the effort transmitted into the environment to produce the outcome. (p. 551)

In addition to anchoring perceptions of control to a strong organismic meta-theoretical base (cf., Bandura, 1986), the notion of control experience helps clear up long-standing confusion in the field about whether control has unequivocally positive effects (Burger, 1989). Researchers have long pointed out that an internal locus of control can be a double-edged sword—when things go well, one can take credit, but when things
go badly, one must also bear the weight of responsibility and self-blame (Christensen et al., 1991). To some extent, this confusion reflects some misunderstandings about the interworkings of the components of control. Clearly the presence of (perceived or actual) contingencies between actions and outcomes is not sufficient to produce beneficial effects, if the person is missing the (perceived or actual) competencies to act on them (Bandura, 1977). In a similar vein, all the (perceived or actual) competencies in the world will not be beneficial if they are operating in a world where these competencies do not lead to desired outcomes. In both these cases, the presence of some of its components does not add up to the presence (or perception) of control. Perhaps surprisingly, even perceived control itself may not always mark an advantageous psychological state. High perceived control can create pressures to act in situations in which an individual may not wish to enact the effective response or to exert the effort; and high perceived control, when acted on in circumstances in which control is objectively low may lead to interactions that highlight the salience of failure, helplessness, and powerlessness.

However, if assumptions about effectance motivation are correct, then experiences of control are not only powerful affirmations or determinants of changes in perceived control, but they should also be the one aspect of control that is unequivocally positive. No matter how bleak the objective conditions, the experience that one is improving them should produce beneficial psychological (and physiological) consequences. And people appear to be amazingly adept at creating experiences of control even in seemingly uncontrollable circumstances. For example, research on coping with life-threatening illnesses has shown that people who cannot affect the cause or cure of their medical conditions, nevertheless find ways to influence its course and symptoms, their own emotional reactions to it, and the effects of the disease process on their loved ones and relationships (e.g., Thompson et al., 1993). In fact, researchers have been forced to stop calling such situations “uncontrollable,” instead labeling them as “low-control circumstances,” to acknowledge the fact that people invariably seem to be able to find something to control and then concentrate their efforts on that outcome—as would be adaptive in both creating experiences
of control and in dispatching one’s limited energetic resources toward outcomes where they can accomplish the most good.

It may be worthwhile to note some disagreement among theorists as to the best label for the need that underlies the power of perceived control. In general, it may be most useful to think of it conceptually as a need for “effectance,” “mastery,” or “competence” because these labels focus researchers on innate desires to be effective in interactions with the environment, to master the environment, and to experience oneself as competent to effect desired ends. These are the core experiences that produce feelings of efficacy that, in turn, motivate actions of evolutionary value, namely, learning how to make things happen in one’s environment.

The drawback of labeling this motivational system as the “need for control” (which seems like the logical moniker) is that the many broad and indiscriminate meanings of “control” may lead researchers away from its more precise focus on personal force and the capacity to produce desired and prevent undesired outcomes, and take them farther afield into conceptual territory that implies the need for power, dominance, authority, control over others, and other superfluous or misleading connotations. In the developmental literature, some researchers argue that, across age and with socialization influences, early experiences of efficacy, mastery, and control are eventually folded into a larger motivational system, one organized around the need for competence broadly defined (Deci & Ryan, 1985; Elliot et al., 2002; Harter, 1978). In this case, the entire spectrum of control- and competence-related beliefs (e.g., perceived competence), actions, and interactions, taken together with the repertoire of actual developing capacities to which these interactions give rise, may fruitfully be referred to as the “competence system” (Skinner, 1995).

3. Perceived control exerts its effects through motivational, emotional, cognitive, volitional, and neurophysiological mechanisms.

One of the reasons why the effects of perceived control are so pervasive is that they operate through so many channels. Although different theories emphasize different mechanisms of effects, taken together, they suggest at least five interrelated pathways through which perceptions of
control can shape mental and physical functioning and well-being. The mechanisms that have been documented most widely are motivational or behavioral, in which perceptions of control have been shown to support readiness and durability of action, as seen in its positive effects on initiation of interactions, preference for challenge, effort exertion, engagement, determination, persistence, and mastery coping. In the same vein, loss of control (or absence of any of its components) exerts downward pressure on motivation, contributing to passivity, preference for easy tasks, withdrawal, disengagement, escape or flight, maladaptive coping, giving up, helplessness, and burnout. The effects of perceived control are also carried via emotional mechanisms. Experiences of mastery or feelings of competence result in enjoyment, optimism, enthusiasm, joy, excitement, pride, and satisfaction, whereas experiences of incompetence or helplessness evoke fear, dejection, discouragement, pessimism, embarrassment, shame, frustration, sadness, and disappointment. These negative emotions are aversive in their own right, and they also sap cognitive and volitional resources in ways that undermine task performance.

Effects are also cognitive, in that a sense of control allows individuals to retain access to all their existing higher-order cognitive capacities for use in hypothesis testing, strategy generation, and action regulation, even under increasing levels of challenge and difficulty. Lack or loss of control can have the opposite effect, resulting in cognitive confusion and loss of previously demonstrated capacities to generate strategies, test hypotheses, and detect contingencies. According to information processing accounts of learned helplessness, prolonged exposure to noncontingency, because it leads to protracted cognitive effort without any cognitive gain (i.e., progress toward a solution), can eventually result in cognitive exhaustion, defined as generalized impairment of constructive and integrative mental processing and complex problem-solving (e.g., Kofta & Sedek, 1998). Exposure to uncontrollable events has also been found to produce volitional or functional deficits (e.g., Kuhl, 1984), which occur when noncontingency triggers a state orientation—defined as a condition in which attention and cognitive activities are focused on the present, past, or future state of the organism. These task-irrelevant thoughts have been found to interfere with
the kind of cognitive processing needed for optimal performance on challenging tasks. Experience with contingent events, in contrast, tends to support an action orientation, in which attention and cognitive capacity are fully focused on generating action alternatives, selecting next strategies, and monitoring the effects of successive efforts.

Some of the most interesting recent research in the area investigates the neurophysiological mechanisms through which (un)controllability exerts its effects (Maier, 2015). Relying largely on animal models, this research follows up on the well-established phenomenon of “learned helplessness,” in which exposure to noncontingent aversive events produces subsequent behavioral deficits even in contingent situations (e.g., failure to learn contingent responses, immobility, exaggerated fear conditioning, impaired fear extinction, anxiety, fear of novelty, and other signs of stress; Maier & Watkins, 2005). This newer program of study investigates immunization effects, in which exposure to exactly the same set of noxious events when stressors are controllable not only completely blocks these behavioral deficits concurrently, but also prevents these same deficits in future encounters with stressors that actually are uncontrollable (Maier & Watkins, 2010).

As reviewed by Maier (2015), these studies show that experience with stressors that are controllable activates the (corticostratial) act/outcome learning circuit, which subserves the detection and analysis of the kinds of contingency information needed to appraise and act on controllable events. This circuit then engages parts of the prefrontal cortex that exert top-down inhibitory control on stress-responsive brainstem and limbic structures that would otherwise trigger the negative physiological and behavioral responses produced by uncontrollable adverse events. Interestingly, both the occurrence of adverse events and the processing of control experience by the act/outcome circuit seem to be necessary to program enduring trans-situational “immunization” effects, in which this top-down inhibitory system is consistently activated in response to subsequent stressors, even if these new events are uncontrollable and quite different from the original controllable events, thereby blunting their impact and promoting stress resistance.
These cascades of physiological, psychological, and behavioral effects of control are consistent with the notion that experiences of control are fundamental to human functioning and well-being. In fact, exposure to uncontrollable adversity is one of the few classes of negative life events that researchers can agree are universally stressful. The effects of prolonged uncontrollability reverberate throughout the neurophysiological stress reactivity system, as seen in elevations of stress hormones, blood pressure, and inflammatory responses, as well as in impairment of immune functioning and deterioration of the brain structures responsible for memory and learning. In fact, early exposure to chronic adverse events (including especially harsh, unpredictable, and uncontrollable parenting) seems to cumulatively program neurophysiological development, tipping systems toward hyperreactive monitoring of threat, exaggerated anxiety and fear reactions, and chronic activation of the endocrine system (Lupien, McEwen, Gunnar, & Heim, 2009). On the positive side, research on immunization suggests that interactions with challenging and controllable events in enriched environments also program the development of the brain, but along a healthier pathway, not only protecting individuals from the deleterious consequences of potentially stressful aversive events, but also buffering them against the effects of future encounters with uncontrollability.

4. Perceived control is constructed and updated based on interactions with the physical and social world.

If an individual’s “internal working model” depicting the potential for control (along with available contingencies and capacities) is going to be adaptive, it must be experience-based. That is, control beliefs should initially be constructed from the actual interactions individuals experience with social partners and physical objects in their proximal environments. This is seen most clearly in research during early infancy, which shows that newborns are able to recognize and respond to sensitivity from their caregivers and begin to construct rudimentary implicit appraisals of the extent to which caregivers are responsive to their expressions of distress and other signals (Sherman, Rice, & Cassidy, 2015). Experiences
of contingent responsiveness contribute to subsequent generalized expectancies of control (Frankenhuis et al., 2013; Rovee-Collier, 1999; Watson & Ramey, 1972). These early generalized expectancies are posited to be constructed as “running totals,” but also to be available for continuous updating or revision based on subsequent experiences.

Such an account may seem to imply that perceived control is really more like a situation-specific calculation that corresponds exactly to current conditions—and so can vary wildly from moment to moment and event to event. However, starting in the earliest days, these control experiences reach in to shape the development of newborns—their actions, the quality of their engagement with caregivers, and the implicit pictures they are creating of the world into which they were born. In fact, the earliest experiences of caregiver sensitivity (which are at the root of a sense of control) seem to program “experience-expectant” neurophysiological systems to function in concert with a safe and predictable environment, in a process known as social buffering of stress reactivity (Hostinar, Sullivan, & Gunnar, 2014). As a result, infants with high generalized (and largely implicit) expectancies of control soon differ from those who experience the world as unresponsive and unpredictable, not only psychologically, but also neurophysiologically. The calmer biology of the stress-buffered infant creates a different platform for interacting with the social and physical worlds. Moreover, this biobehavioral readiness to engage constructively with new and interesting people and things leads to more opportunities to deal with challenging events—which are precisely the experiences that have been found to “toughen” or “steel” individuals in dealing with future stressful encounters.

By the time children’s representational capacities come fully on line at the end of the second year of life, resulting in the recognition and representation of a sense of self, they have behind them literally hundreds of thousands of control experiences. These experiences have been generated partly by the child’s own goals and behaviors during interactions with people and objects, and the meaning of these experiences has been filtered though the child’s initially implicit understandings of control, combined with interpretations offered by caregivers as the child becomes
better able to communicate using language. These interlocking implicit and explicit components of the competence system enable and constrain children’s actual experiences of control as well as the messages that they take away from such experiences. Over time, based on this history of objective and subjective control, children’s views take on the character of “apparent reality”—creating a durable picture of the world’s causal structure and of the role of their own personal force in shaping the events in their lives that matter.

5. Because of its feed-forward and feedback effects, perceived control participates in recursive dynamics that can verify or amplify its conclusions over time.

Perceived control, through all the mechanisms described previously, reaches into the future and shapes individuals’ actions, the quality of their engagement, and their actual effectiveness in producing desired and preventing undesired outcomes. These interactions in turn feed back into individuals’ internal working models of the potentials for control. As can be imagined, because control experiences are shaped by the very actions that are being directed by control expectancies, these feedback loops have the potential to create a recursive dynamic (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Skinner, 1991, 1995). People who initially expect to be able to exert control are attracted to and select challenging opportunities; they engage with vigor and enthusiasm; they concentrate on the task at hand, attending to and learning from both success and failure; they persist when the going gets tough and try out a variety of constructive ways of coping that expand their options for effective action, including strategizing, information seeking, help-seeking, and negotiation. As a result, they learn more from challenging encounters and, win or lose, build a repertoire of more effective actions and coping strategies. In other words, they become objectively more competent, and so cement their underlying confidence and expectations for control.

In contrast, people who initially doubt their capacity for control tend to avoid difficult tasks or to engage in them half-heartedly, exerting little or no effort, wasting cognitive resources on anxiety and misgivings, and
distracting themselves from a focus on the task; they withdraw at the first sign of problems, preferring to retreat or escape; they show patterns of maladaptive coping, like confusion, rumination, or helplessness that interfere with constructive reengagement with the stressful situation. As a result, they do not benefit from encounters with challenge and difficulty; they forgo opportunities to learn or gain new capabilities. Over time, they become less and less competent objectively. These experiences of failure cement their feelings of incompetence and an external locus of control.

This dynamic, in which those “rich” in mastery and competence become “richer” over time whereas those initially “poor” in confidence become even “poorer,” likely contributes to the durability and power of perceived control and self-efficacy. Because the beliefs about control, contingency, and capacity that make up the competence system are internal working models, they are—in principle—open to disconfirming experiences. That is, in principle, they are plastic and can be reworked. However, in practice, because they generate their own confirming experiences, they are not likely to encounter disconfirming evidence in the normal course of events. Moreover, it turns out that many stressful encounters are murky or ambiguous in nature. As a result, an important determinant of whether stressors will be experienced as controllable or uncontrollable depends on how they are appraised or interpreted (Folkman, 1984). Even obvious successes can be discounted by attributing their occurrence to powerful others, luck, or chance.

In fact, causal concepts like ability and competence are inherently inferential, requiring high performance on difficult tasks with little effort where others fail. Few experiences of success provide unambiguous evidence of this kind of control or competence, especially after children develop the capacity to generate complex cognitive inferences about causes—for example, about the inverse compensatory relationship between effort and ability (Nicholls, 1984), which allows them to infer that performances that require high effort provide evidence of low ability. This insight has led motivational researchers to focus on individuals’ conceptions of ability as an anchor of the competence system and as a key lever of change.
In her groundbreaking program of research on learned helplessness, achievement goals, and conceptions of ability, Carol Dweck (1999, 2006) has articulated a first principle of working models of potential control, namely, people’s assumptions about the nature of the “personal force” that is exerting control. One option is a conception of “ability” entailing the characteristics ascribed by our culture: as a fixed entity of a certain size which, if it is large, we are in charge of proudly demonstrating whenever possible; or, if it is small, we are in change of preventing its embarrassing exposure. Such a “fixed mindset” leads to all the disadvantages connected to low perceived control; in order to look smart and avoid revealing low ability, individuals sidestep challenges, give up easily in the face of obstacles, see effort as worthless or as signaling a lack of ability, avoid or defend against potentially useful negative feedback, and feel threatened by the success of others.

A second option is to continue to view competence in the same way that most young children do, namely, as an undifferentiated amalgam of “personal force” that combines a positive synergy between inherently intertwined efforts and abilities. This kind of “growth mindset” assumes that competence develops and expands through effortful application, practice, and diligence, and so we are in charge of improving and making progress in our competencies. This leads to a focus on mastery and the desire to learn, and it emboldens individuals to embrace challenges, to persist in the face of setbacks and obstacles, to see effort as the pathway to development, to seek and learn from criticism, and to find lessons and inspiration in the success of others.

6. Perceived control develops throughout the Lifespan, starting with neonates’ early detection of contingency and sensitive responsiveness.

Any claim that perceived control exerts its effects across the Lifespan must immediately be followed by a relatively large disclaimer—it turns out that there is not yet a robust literature systematically documenting developmental changes in how perceived control is organized and functions (Elliot et al., 2002; Flammer, 1995; Skinner, 1991, 1995; Weisz, 1986). In fact, the overwhelming majority of studies target individual differences,
and even when studies do mention “development,” the issues on which they focus typically involve the origins of these individual differences (i.e., where they come from and the kinds of antecedent experiences that lead people to construct different kinds of internal working models of control).

For a developmentalist, however, the questions central to a developmental account of perceived control focus not only on how individual differences in developmental trajectories are created and maintained or deflected, but also how normative developmental changes produce age-graded transformations in the functioning of the competence system. These include developmental changes in the experiences that contribute to a sense of control, in the causal reasoning that interprets experiences into beliefs, in conceptions of the causes used to explain control experiences (like ability, chance, luck), and in the nature of the self to which control is attributed. Amidst all these changes, however, some constants can be identified, namely, the power of the sense of control to launch action and the unfailingly positive effects of experiences of control.

A lifespan view on control attempts to draw these developments together (e.g., Heckhausen & Schulz, 1995; Rothbaum, Weisz, & Snyder, 1982; Skinner, 1995). One way to think about them holistically is to conceptualize the development of control during childhood as the progressive realization of the limitations of one’s own competence. As children’s causal reasoning and conceptions of causes become more differentiated and realistic with age, the toddler’s global undifferentiated sense of agency is distinguished from the efforts of other people and the power of his or her own longings and wishes; it becomes successively bounded by an appreciation of the nature of task difficulty and the understanding that chance is not under personal control; and it is humbled by inferences about one’s own capacities that now include progressively more challenging normative demands and comparisons to other children’s accomplishments.

Adulthood, in contrast, can be conceptualized as a time of increasing recognition of the boundaries of “contingency”: a realization of the limits of human control and the narrow range of outcomes that can potentially
be influenced by human action. Adults come to realize that society imposes decisive constraints on the people and competencies that will be rewarded, that history changes contingencies even within our lifetimes, that chance and fate play key roles in all of life’s successes and failures, that even our own abilities are to some degree a matter of luck, and that the really important outcomes—death of self and loved ones—have always been out of human control.

Hence, the essential developmental questions for childhood and adulthood can be juxtaposed. During childhood, how can children maintain a sense of control in the face of the developing realization of the limits of their own competence? And, during adulthood, how can people maintain a sense of control in the face of the developing realization of the chaos of the world? The answers to these questions may be complementary. In childhood, children are able to maintain a sense of control only if conceptions of omnipotence are replaced by a view of “personal force” that binds together effort and ability and sees them as highly plastic capacities that can grow with effort, practice, and effective strategies. The construction of this view requires all the social supports needed to develop actual competencies as well as the pervasive experience of effective interactions with the social and physical world, scaffolding that offers good tactical suggestions, and interpretations that maintain focus on the task and approaches to mastering it. If children do not have these experiences, if they do not develop a growth mindset and real competencies, omnipotence is replaced by the development of helplessness.

This efficacious self is a crucial resource that allows adults to meet the increasingly chaotic world and continue to maintain a sense of control. “Coping” is one label for how people create and find control even in aversive circumstances, re-establish control that has been challenged or lost, and, in so doing, discover and nurture a more competent self (Aldwin, 2007). Accommodative processes encompass ways to divert or minimize the harm that comes from losses of control. The resilient competence systems that result from successfully utilizing these processes are ones in which people basically apply the wisdom of the Serenity Prayer: They
acknowledge the forces of powerful others, society, and chance, but do not doubt the strength and efficacy of the self and its allies, and they maintain grace and optimism so that, whatever unexpected events may befall them or their loved ones, they can (eventually) deal with them in ways that allow them to both withstand losses and cherish what remains, and so craft deeply satisfying lives.

7. Perceived control is not the only (or the most important) psychological need.

Perhaps it is no longer so essential, now that perceived control is not the dominant player in research on motivation, coping, and the self, to explicitly acknowledge the limitations of control constructs. Perhaps today it goes without saying that estimates of control are not the only appraisals that matter in stressful situations; that a sense of control is not the only social cognition that shapes initiation, engagement, and persistence; and that loss of control is not the only injury that creates discouragement and sadness. As attachment theory has been extended across the Lifespan and as self-determination theory has found widespread acceptance, it is clear that needs for belonging (Baumeister & Leary, 1995) and autonomy (Deci & Ryan, 1985) are equally fundamental as sources of motivation and as supports for physical and mental functioning and well-being.

To be sure, there are still a few last remnants of the field’s preoccupation with control, as can be seen in efforts to clarify the proper conceptualization of “secondary control” and to pull research on accommodative processes out from under the umbrella of control and into the aegis of autonomy where it has always belonged (Brandstädter & Renner, 1990; Morling & Evered, 2007). Clarifying the edges and limits of control is very helpful to the study of its effects and to the study of its interactions with other needs and other kinds of perceptions and internal working models (Deci & Ryan, 1985; Connell & Wellborn, 1991; Skinner, 1996).

The identification of multiple powerful belief systems allows researchers to begin to examine the synergies and tradeoffs among important human commitments and how individuals negotiate among them when
dealing with stressful events or situations in which they are pitted against each other. Our research participants have always known that there are more options for coping with difficult life events than effortful exertion and strategic problem-solving (aka primary control) or giving up and relinquishing control (aka helplessness) (Rothbaum et al., 1982). It would be handy if control researchers would also consider an expanded range of ways of dealing with obstacles and setbacks, including information seeking, instrumental or emotional support seeking, negotiation, willing acceptance, positive reappraisal, distraction, and so on (Aldwin, 2007), even if these ways are not predicted primarily by control, but instead by a sense of belonging or autonomy. In interventions to improve functioning and well-being, the broader and more flexible the repertoire of coping that can be achieved, the better (Cheng, Lau, & Chan, 2014).

FUTURE DIRECTIONS FOR RESEARCH ON PERCEIVED CONTROL

Three areas important to future research on control entail the study of the dynamics, the development, and the intentional optimization of the competence system. The dynamics of perceived control refer to the simultaneous study of its feed-forward and feedback effects and how, together, these create cycles that can be self-amplifying (i.e., virtuous or vicious circles) or self-compensating (e.g., when people respond to losses of control by seeking out aspects of the situation where they can have a positive impact). Most investigations in the area focus on the ways that control appraisals shape subsequent motivation, emotion, or coping, but they do not follow these actions into future episodes in order to capture the effects of these experiences on subsequent estimates of control. Studies that capture the entire cycle of functioning of the competence system are rare, but those that do begin to provide pieces of the puzzle that we have not seen before. One strategy that may be helpful in capturing episodes of control is the use of intraindividual time-series designs (e.g., Miró, Martínez,
Sánchez, Prados, & Medina, 2011; Neupert, Almeida, & Charles, 2007; Ong, Bergeman, & Bisconti, 2005; Schmitz & Skinner, 1993). Such daily-diary–type studies have been very useful in “looking under the hood” to discover how perceived control functions in helping people deal with challenging tasks or stressors, and how the outcomes of these efforts feed back to shape subsequent perceptions of control.

Interventions to Improve the Competence System

Research on perceived control suggests a host of intervention levers for improving individual mental and physical health and functioning. However, the yields from these interventions have not always been as great as would be expected. One strategy for improving their impact might be to shift the target of interventions away from simply trying to boost effort (and change attributions of failure to lack of effort) and to refocus more clearly on optimizing participants’ “experiences of control.” These experiences are admittedly complex, in that they involve “the accumulation of action-outcome episodes that accrue from an individual’s actions in a set of objective control conditions that the individual interprets according to his or her subjective control beliefs” (Skinner, 1996, p. 560). However, because experiences of control are at the core of explanations for why objective and subjective control have such powerful effects across the Lifespan, it can be argued that improving them should be the target of interventions designed to enhance functioning by fostering a sense of control. Such programs will only be effective to the extent that they actually improve and sustain experiences of control.

For example, this optimization strategy can be fruitfully applied to research in schools, where educators have been understandably eager to help cultivate the development of a “growth mindset” in their students. In this work, there has been some confusion about the messages and experiences that can best accomplish this goal (Dweck, 2015). Just as early attempts made in attributional retraining studies during the
1980s aimed at promoting a sense of control, educators can easily over-emphasize their messages focused on the power of effort, essentially encouraging students to “try harder” and to attribute failures to lack of effort. If these messages lead to high levels of exertion with no appreciable gain in academic performance, they can backfire and convince students that their efforts are useless (e.g., Schmitz & Skinner, 1993). Dweck and colleagues (e.g., Paunesku et al., 2015) emphasize students’ task-focused search for effective strategies as the intervention most likely to create experiences of competence, progress, and control (for other work aimed at identifying effective strategies, see also research on self-regulated learning and academic achievement; e.g., Winne & Nesbit, 2010; Zimmerman & Schunk, 2011).

Developmental Transformations

The competence system of the newborn does not resemble that of the one-year-old or the toddler or the young child. It begins as a system that is completely dependent on caregivers to deal with the neonate’s every need, and, in three short years, it is transmuted into a system that is part of the walking, talking, neurophysiologically reorganized young child’s self, guided by an agent who not only wants to but is able to strategize, problem-solve, and reach many goals independently and is beginning to self-regulate its own emotions and actions. From the first days, the motivational engine of the system is visible in infants’ interest and insistence on engaging the world of people and objects, and in its capacity and will to learn all about the contingencies and affordances available there. We see incontrovertible evidence of qualitative transformations in these systems in the everyday lives of our children and ourselves, but we still know little about how these developments, and the ones that follow, are accomplished. Future research that explores this terrain will be helpful in guiding interventionists in the creation of programs designed to prevent and ameliorate helplessness and to promote confidence, efficacy, and the development of actual competence.
CONCLUSION

In looking forward to the next 50 years of research on locus of control and its control-related progeny, it may be useful for investigators to take to heart the lessons learned collectively over the past several decades. These include the notion that working models of the potentials for control include both naïve constructions of the causal structure of action–outcome contingencies as well as understandings of competencies and access to other causes. However, these are all anchored by convictions about one’s own personal force and experiences of making things happen. These beliefs entail hot potent convictions that are more than situation-specific perceptions but less than traits. They achieve their status as arbiters of “apparent reality” based on the hundreds of thousands of previous interactions that give rise to them, and they achieve their durability by contributing to subsequent experiences that tend to confirm or amplify their sentiments.

Control (both actual experiences of control and a sense of control) exerts a cascade of biological, psychological, and behavioral effects, starting in the first days of life, and continuing to shape motivation, emotion, cognition, volition, and neurophysiological reactions throughout the Lifespan, but how it is constructed and expressed is systematically transformed over development, showing regular age-graded shifts in its organization and functioning. Perceived control is the potent tip of the iceberg that is the powerful competence system. As pointed out by leaders in the field, our enduring interest in control reflects its status as a fundamental human concern and as a powerful source of both energy and despair (Rotter, 1990). If researchers can continue to approach its conceptualization and study with the richness and complexity it merits, we may turn out to be deserving beneficiaries of the legacy to which Julian Rotter’s pioneering efforts have continued to contribute.

REFERENCES


