PERCEIVED CONTROL

Theory, Research, and Practice in the First **50** Years

EDITED BY JOHN W. REICH FRANK J. INFURNA

OXFORD

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Press in the UK and certain other countries.

Published in the United States of America by Oxford University Press 198 Madison Avenue, New York, NY 10016, United States of America.

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Library of Congress Cataloging-in-Publication Data Names: Rotter, Julian B., honoree. | Reich, John W., 1937– editor. | Infurna, Frank J., editor. Title: Perceived control : theory, research, and practice in the first 50 years / edited by John W. Reich, Frank J. Infurna. Description: New York : Oxford University Press, 2016. | Includes bibliographical references and index. Identifiers: LCCN 2016009678 | ISBN 9780190257040 (hardback) Subjects: LCSH: Control (Psychology) | Social psychology. | BISAC: PSYCHOLOGY / Social Psychology. Classification: LCC BF611.P467 2016 | DDC 153.8—dc23 LC record available at https://lccn.loc.gov/2016009678

987654321

Printed by Sheridan Books, Inc., United States of America

I want to acknowledge the help and, above all, patience, that my wife Deb has always shown in my work and family life. —John W. Reich

To my parents, Anna and Joe, for your love and support and being the ultimate example of how hard work, dedication, and motivation can put you in the position to succeed in life. —Frank J. Infurna

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CONTRIBUTORS

Lyn Y. Abramson Department of Psychology University of Wisconsin–Madison Madison, Wisconsin

Lauren B. Alloy Department of Psychology Temple University Philadelphia, Pennsylvania

Meaghan Barlow Department of Psychology Concordia University Montreal, Quebec, Canada

Jerry M. Burger Department of Psychology Santa Clara University Santa Clara, California

Marshall P. Duke Department of Psychology Emory University Atlanta, Georgia Patricia Frazier Department of Psychology University of Minnesota Minneapolis, Minnesota

Jutta Heckhausen Department of Psychology and Social Behavior University of California, Irvine Irvine, California

Frank J. Infurna Department of Psychology Arizona State University Tempe, Arizona

Margie E. Lachman Department of Psychology Brandeis University Waltham, Massachusetts

Ellen J. Langer Department of Psychology Harvard University Cambridge, Massachusetts Sayyed Mohsen Fatemi Department of Psychology Harvard University Cambridge, Massachusetts

Liza Meredith Department of Psychology University of Minnesota Minneapolis, Minnesota

Beth Morling Department of Psychology University of Delaware Newark, Delaware

Stephen Nowicki Department of Psychology Emory University Atlanta, Georgia

John W. Reich Department of Psychology Arizona State University Tempe, Arizona

Stephanie A. Robinson Department of Psychology Brandeis University Waltham, Massachusetts

Liza M. Rubenstein Department of Psychology Temple University Philadelphia, Pennsylvania

Richard Schulz Department of Psychiatry University of Pittsburgh Pittsburgh, Pennsylvania Ellen A. Skinner Department of Psychology Portland State University Portland, Oregon

Bonnie R. Strickland Department of Psychology University of Massachusetts Amherst, Massachusetts

Howard Tennen Department of Community Medicine and Health Care University of Connecticut School of Medicine Farmington, Connecticut

Brandilynn Villarreal Department of Psychology and Social Behavior University of California, Irvine Irvine, California

Kenneth Wallston School of Nursing Vanderbilt University Nashville, Tennessee

Carsten Wrosch Department of Psychology Concordia University Montreal, Quebec, Canada

Perceived Control

Perceived Control

50 Years of Innovation and Another 50 to Go

FRANK J. INFURNA AND JOHN W. REICH **B**

The importance of gaining a scientific understanding of the construct of perceived control has been a major focus in psychological science and practice for more than a half a century. This was largely initiated by the publication of Julian Rotter's (1966) paper on generalized expectancies for internal versus external control of reinforcement. For our purposes, the publication date of 1966 is particularly significant because the year of publication of our volume on perceived control is exactly 50 years after Rotter published his groundbreaking article. This edited volume is a tribute, an intellectual celebration, of the staying power of his basic ideas and their influence through time and across disciplines. Although counts vary, there have been at least 4,000 original source articles applying those ideas and more than 20,000 citations on Google Scholar. Few, if any, constructs in all of the psychological sciences have had such an extensive and enduring influence.

The purpose of this edited volume is to showcase the breadth of research that has accumulated since Julian Rotter's original article on locus of control. The construct spans multiple disciplines, not exclusively psychology, but also sociology, clinical, economics, health, and business, among others. Our goal was to include chapters that span these disciplines and cover the breadth and importance of the construct of perceived control. Furthermore, the authors of each chapter in our volume were instructed to focus not only on their research using constructs associated with perceived control in their area of expertise, but to also focus on future directions that are important to further illustrate how the construct of perceived control can continue to be important, meaningful, and relevant.

As work using the basic concept of locus of control has progressed, two major ways of thinking about the general concept have evolved. One is thinking of perceived control as a personality trait, stable, enduring over time and situations. This tradition encompasses such topics as the original locus of control concept and the many allied terms as reviewed by Ellen Skinner in her seminal paper (Skinner, 1996). This includes concepts that are related to control beliefs, such as self-efficacy, personal mastery, and competence, and more specific topics, such as health locus of control and desire for control. Of specific interest is the coverage of individualism-collectivism and cross-cultural differences in perceived control, which continues the tradition of approaching the issue from a trait perspective.

The second general category of thinking about perceived control focuses on cognitive processes. This tradition broadly refers to a more heterogeneous category of topics that emphasize control-related beliefs and processes influencing how the individual relates to his or her environment. Specific issues here involve the role of perceived control in influencing information processing, primary versus secondary control, accommodation, learned helplessness, modes of behavioral versus perceived control, illusion of control, control over health, adjustment to stressful life circumstances, and more recent heuristic concepts such as mindfulness. One separate distinctive tradition in this literature is the development and testing of interventions to enhance control beliefs through experimental manipulations. As we describe later in this chapter, at least a dozen such interventions have been reported in the literature. All of them report resulting in positive effects on mental health and behavioral functioning. This "proof of concept" literature is convincing empirical evidence of the power of the perceived control approach to human functioning.

Historically, these literatures have developed separately. We asked ourselves: is there an overarching theme that can unite these functionally different areas especially in the face of their seemingly common terminology? Rotter himself has given us a useful way of thinking about this in his concluding thoughts (1966, p. 25):

A series of studies provides strong support for the hypotheses that the individual who has a strong belief that he [sic] can control his own destiny is likely to (a) be alert to those aspects of the environment, which provide useful information for his future behavior; (b) take steps to improve his environmental condition; (c) place greater value on skill or achievement of reinforcements and be generally more concerned with his ability, particularly his failures; and (d) be resistive to subtle attempts to influence him.

From this perspective, perceived control can be thought of as a key component of either our trait personality makeup or our cognitive processing that, in either case, enhances functioning and, ultimately, survival. Adaptability and effective functioning are themes that can integrate both approaches. Given the similar overarching concepts but different approaches, each chapter in this volume considers and discusses how this way of thinking has given us such a powerful tool for understanding individual–environment dynamics. Questions include whether each author sees a connection between this area and contemporary (and future) developments in such productive topics as resilience, cognitive-behavior modification therapy, mindfulness meditation, life span developmental milestones and transitions, biological/neuropsychological understanding of health and adaptation, and the like. One purpose of our edited volume is to show the entire field of psychology how perceived control concepts

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have been discovered, utilized, and can sustain a thriving area of research into the future.

Our own chapter here will provide a brief overview of each of the contributions to the edited volume without going into too much detail about each; we end by discussing future directions for research that we feel will be fruitful for further pursuit.

WHAT HAVE THE FIRST 50 YEARS OF RESEARCH ON PERCEIVED CONTROL BROUGHT US?

Each of the chapters of this edited volume covers a different topic, demonstrating the breadth of applicability of the construct of perceived control. Altogether, the authors have wide-ranging experience of and history with the construct, varying from working directly with Julian Rotter to being graduate students beginning their careers in this area of research. We next briefly discuss each of the chapters, how they contribute to the edited volume, and their main take-home points. Because our brief summary is by no means all-encompassing, we strongly urge you to read each chapter to see the power of the authors' insights into their various interpretations on the construct of perceived control.

Bonnie Strickland was a graduate student in clinical psychology at Ohio State and was a participant in Rotter's class as he worked on developing items for his initial work on what turned out to be his Locus of Control (LOC) scale. Her chapter explains in detail the activities of the various people (e.g., James, Phares) who also worked on the development of the scale. All were working within the social learning theory (SLT) conceptual framework of skill versus chance conditions that Rotter was attempting to capture in the psychometric developments active at that time. Strickland began applying Rotter's model to children's control beliefs. The Nowicki-Strickland scale (Nowicki & Strickland, 1973) is still the core of many investigations of children's beliefs and behaviors and is covered well in Nowicki's chapter in this volume (Nowicki & Duke, this volume). In her own investigations of locus of control in adults, Strickland reports studying student political activism, religion, achievement, and competence, and, fortunately, she also discusses her major contributions in the area of health beliefs and behaviors. As with many of the other chapters in this volume, she describes the problems resulting from differing definitions and characterizations of control.

Jerry Burger (Chapter 3, this volume) devotes his chapter to reviewing the extensive body of research on the construct he developed; namely, desire for control (DC). Early in his career, he had the insight that the fastdeveloping literature on locus of control was limited to *perceptions of control* and did not deal with *motivation for control*. Still a graduate student, his initial forays into this new topic were first oriented toward assessment and resulted in his Desire for Control Scale, designed as a personality inventory (Burger & Cooper, 1979). Numerous language translations and hundreds of studies later, his current chapter reviews this literature with a focus on DC's relationship with locus of control constructs and measures. His results conclude that some relationships are usually found (greater DC relates to greater internality), but these depend on the particular dimension of control being assessed.

Burger then reviews the relationship of DC with illusions of control (e.g., gambling, superstitious behavior) and unrealistic optimism; high levels of DC relate to higher levels of such states. Finally, he discusses the "mismatch hypothesis," the degree of alignment between DC and situational control or lack thereof. Mismatch shows up as interactions of DC and control (high vs. low levels on each variable) on such conditions as depression, anxiety, and obsessive-compulsive behavior. This line of reasoning has led to successful interventions designed to give persons more control.

Beth Morling (Chapter 4, this volume) sets the task of connecting the by-now large body of research and theory on culture and constructs of control. Cultural psychology is the study of how cultural traditions and practices regulate psychological processes. Perceived control theory has been based overwhelmingly on Western, individualistic, middle-class samples and thereby misses much of the psychological world of non-Western cultures, as she so ably points out. A key development in elucidating the problems in connecting these dots is the model of Rothbaum, Weisz, and Snyder (1982). Their approach discriminated between primary and secondary control; Western samples tend to emphasize the former, whereas many cultures in Morling's studies on Asian societies emphasize the latter. Her discussion of a number of intercultural differences then leads to the suggestion that we should shift attention from "inside the head" to outward situations. This "situation scope" approach suggests greater attention paid to the environment of the person and his or her cultural situation. This richer approach allows a more realistic understanding of the types of control that shape individuals' preferences and choices. This type of approach leads us to realize that people shape their beliefs, including their beliefs in their own personal control, in ways that are culturally shaped.

Ken Wallston took a first-year graduate class with Julian Rotter in clinical psychology but then switched to social psychology. Several years later, he (and his wife Barbara) revisited the original locus of control thinking by applying Rotter's main conceptual underpinnings (SLT) to health-related issues of patient populations. This involved moving the "generalized model" to a specific model of health-related locus of control. His chapter (Chapter 5, this volume) presents a detailed discussion of the many issues surrounding the construction and validation of his scale and how, after many studies, he decided that a multicomponent model is needed (involving chance and powerful others along with internality). Eventually, however, he discovered that even the component subscales did not always result in expected outcomes, with significant correlations with overt health behaviors. He has now concluded that perceived self-efficacy is the most effective way to think of personal control in health issues.

Fatemi and Langer (Chapter 6, this volume) present a detailed discussion of mindfulness, Langer's contributions in explicating the logical status of the concept, and a number of ways in which it plays out in improving mental health outcomes. The logic underlying the well-known Langer-Rodin study on nursing home residents is contrasted with that of the Schulz studies on a similar population. The former's intervention encouraged primary control, now characterized as a form of mindfulness, whereas one of the latter's intervention conditions moved control out from the individual into the staff who were, in effect, encouraging secondary control; in this interpretation, the latter was encouraging mindlessness. Fatemi and Langer then argue that mindfulness creates greater flexibility, enhanced experiential awareness, greater choice and freedom of behavior, and greater mental processing of possibilities. With a global increase in mindfulness, there can be a greater sense of togetherness, synergy, understanding, and empathy.

Early in his career, Steven Nowicki worked with Bonnie Strickland in aiming to develop a locus of control scale for children comparable to the Rotter LOC scale for adults. Nowicki and Duke (Chapter 7, this volume) devote their chapter to discussing the many variations on the basic theme of children's control beliefs and revealing a number of conceptual differences. A key conceptual advancement in this area was made by the Rothbaum, Weisz, and Snyder discussion of primary versus secondary control. More recent advancements have extended this thinking to developmental changes over the life span (Villareal & Heckhausen, Chapter 11, this volume), with discussion of Nowicki's longitudinal studies of changes in control beliefs over a 30-year time span. Pat Frazier's work on temporal dimensions of control beliefs (past, present, and future, presented in Chapter 8 in this volume) is shown to be related to mental health. Chapter 7 also reviews Nowicki's work that has been influential in revealing control belief variables' effects in academic achievement and mental and physical health.

Frazier, Tennen, and Meredith (Chapter 8, this volume) have become linked professionally through collaboration on issues of mutual interest. In their chapter, Tennen describes his work on associations between control and health; in turn, his work was picked up by Frazier, resulting in collaborative work on post-traumatic stress disorder (PTSD). Meredith, working with Frazier, has been instrumental in developing an online intervention centered on perceptions of controllability of one's current condition. Tennen's contribution focuses on his work, much of it in collaboration with Glenn Affleck, on the role of control in contributing to adjustment to physical illnesses. Employing the Rothbaum, Weisz, and Snyder conceptualization of primary and secondary control, they found that perceived benefits of illness acted as good indicators of adjustment, characterizing them as a "backup" of secondary control in the face of uncontrollable factors in illness. Frazier has found that a key dimension to adjustment is the temporal dimension (i.e., perceived control over the past and present and anticipations of control over future events). Control over the present, the most healthful form of control perception, has led to Meredith's current work on developing therapeutic interventions. They report on the various versions of their online control-enhancing modules. These have been shown to enhance perceptions of present control, which in turn is related to improvements in measures of adjustment.

Robinson and Lachman (Chapter 9, this volume) provide a broad overview of antecedents and outcomes of perceived control. They review differences based on sociodemographics and focus on the implications of perceived control for building interventions to improve quality of life for individuals in midlife and old age (a topic reviewed from a different perspective by Barlow, Wrosch, Heckhausen, and Schulz, Chapter 12, this volume). In developing this framework, they review the literature on perceived control and health beliefs and behaviors, cross-cultural differences (as did Beth Morling, but as a between-person factor for contributing to differences in perceived control), age, and longitudinal changes in control over the life span. They clarify issues involved in research on self-control and self-regulation and control beliefs; this suggests important distinctions between beliefs and actual performance. Their main topic concerns the value of optimizing perceived control interventions. Such interventions to enhance control can be made more effective by incorporating information from the individual's current control beliefs, perceived abilities, and related beliefs and cognitions. Cognitive restructuring techniques have been shown to be effective in enhancing performance, and, they discuss the role of behavioral skills training for enhancing control beliefs and leading to better health and well-being. They suggest personalized interventions to foster adaptive behavior changes by taking into account levels of perceived control as the next frontier in their research on perceived control and in the field as a whole.

Rubenstein, Alloy, and Abramson (Chapter 10, this volume) briefly review the historical development of the learned helpless/reformulated model of depression that evolved from Rotter's original LOC model. This area focused on the perceptions that people have in dealing with judgments of the contingent relations between their efforts and the controllability of their events (skill vs. chance). Some people do not readily see such connections and develop generalized perceptions of not having a causal relationship with their experiences, thus leading to a state of learned helplessness. An entire body of research literature developed from these initial insights is reviewed by the authors. They focus on a variety of main themes, including judgments of control and analysis of perceptions of contingency in the context of clinical depression, prediction behavior and levels of optimism toward predicting future outcomes, classic research on internal versus external attributional style for positive and negative events, and the boundary conditions of these basic effects. The authors project possible trajectories of this kind of work into the future. They suggest that more attention be given to biological factors, particularly making the point that neuroscience techniques can be used to locate brain neural regions responsible for these effects. Behavioral neuroeconomics analyses may be helpful because much of the learned helplessness research is based on skill versus chance conditions. Perceptions of control may be ultimately found to be based in functional brain structural differences.

Villareal and Heckhausen (Chapter 11, this volume) present a review of the key components of the motivational theory of life span development (see Heckhausen, Wrosch, & Schulz, 2010). This model traces out the theoretical and empirical implications of melding perceived control constructs with a dynamic model of goal striving. Concepts of primary and secondary control are enlisted as responses to personal actions that are, to varying degrees, successful at achieving desirable goals. In applying this general model, important changes in these components are necessitated by advancing age, thus resulting in a model of life span development. Different goals arise during the course of advancing age, and these in turn are met with dynamic changes in primary and secondary control strategies. Successful aging results when a match occurs among personal control beliefs, optimum choices of goals in the context of appropriate personal resources, and selective but appropriate use of primary and secondary control strategies.

In terms of future directions for this line of research, the authors suggest that interventions should focus on maximizing flexibility in finding ways to enhance the match or congruence between actions and goal attainment. This must necessarily take into account changes in goals that occur over the life span. One individual difference variable that could be targeted for intervention is optimism, which should function to enhance persistence in goal striving. This model would be particularly useful when applied to young adults as they face multiple challenges in their transition to full adulthood. Another fruitful area of application is developing effective models to help students achieve greater perceived academic control.

Barlow, Wrosch, Heckhausen, and Schulz (Chapter 12, this volume) focus on how constructs associated with perceived control, such as goal engagement and goal disengagement, are instrumental in protecting older adults from age-related declines in physical health. They couch their discussion in the context of the motivational theory of life span development (Heckhausen, Wrosch, & Schulz, 2010) and how older adults can rely on different strategies of goal engagement and disengagement for managing physical health declines in old age. Future directions for research include, first, studying how it is that perceived control constructs can help individuals manage well as they move from disease-free to subclinical and chronic illness and then to terminal illness (e.g., disablement process model, Verbrugge & Jette, 1994), which can be done via the lines-ofdefense model (see Heckhausen et al., 2013). Second, the focus of control strategies should not be constrained to old age, but applied to all parts of the life span. Third, the mechanisms that link control strategies to the protection from decline with physical health need to be explored. This research can help illuminate the factors that facilitate an adaptive use of control strategies. Finally, they discuss the importance of interventions and how control strategies are a viable target to help improve physical health and successful functioning.

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Ellen Skinner (Chapter 13, this volume) presents an overview of the important lessons learned from the concept of perceived control over the past several decades. She focuses her chapter on seven guideposts for current and future research; these broadly focus on the construct of perceived control and the concepts associated with it and the multiple pathways through which perceived control influences pertinent outcomes and antecedents of perceived control throughout the entire life span (from infancy to adulthood and old age). Future directions that Skinner highlights include the dynamic feedback that constructs of perceived control engages and how future research should focus on ways to capture this (e.g., daily dairy research designs). An additional focus for future research is on interventions to improve the competence system. There are multiple avenues and systems through which researchers can intervene, and perceived control can be instrumental in effecting this; studying developmental transformations presents opportunities to focus on periods of development in which there is the potential for much positive change.

WHAT ARE IMPORTANT FUTURE DIRECTIONS TO PURSUE?

Given the breadth of the perceived control construct and the contributions of each of the authors to enhancing the field, this leaves us with the question of what else is there to be studied? This is something we wanted each author to discuss in his or her chapter, and we have already briefly mentioned some of their ideas. The first 50 years have brought a wealth of knowledge, and perceived control has been studied across a myriad of contexts and disciplines. We next discuss the potential for expanding and deepening the reach of this highly productive approach into the next 50 years and perhaps beyond. At this point, we see three major areas in which current developments show promise for carrying the field of control studies into future theory, research, and action.

Expanded person-by-environment models. Rotter based his initial model on an expansion of SLT, an amalgamation of learning theory with

the newly developing interest in cognitive processes. Basing his approach on fundamental principles of learning was probably key to its reception in the broader field of psychology. However, his rather dry cognition approach essentially ignored the motivational and emotional aspects of perceived control beliefs. By engaging with this new approach, Burger (Chapter 3, this volume) opened up the field to the language of personal strivings and motivations. Along with Rotter's main theme, this second approach consolidated an already individualistic, mental trait approach that continues to this day. But, with increasing theoretical and particularly methodological sophistication developing in the broader field of psychology, this new wave ultimately necessitated a more inclusive approach. These developments made it possible for the field to incorporate information about the environment of events in which the person is functioning in addition to the person's inner mental states.

We now see the spread of person-by-situation (P×E) models of the linkage of a person's personal traits and his or her experiences of events. Beth Morling's discussion (Chapter 4, this volume) of "situation scope" to explain intercultural differences in control processes related to environmental differences is very much in tune with this general model. Stemming from the pioneering work of Holmes and Rahe (1967), examining the impact of life events through the assessment of both major and small daily events that people report experiencing became a major methodological advancement. Events were shown to be a separate significant source of variance in accounting for well-being. A perceived control perspective on events became a valuable addition to this approach. Seeing oneself as a cause of events as opposed to passively experiencing them in DeCharms's (1978) model of causation of events, categorized as "origin events" versus "pawn events," showed the positive effects on perceptions and behaviors when a person has more origin than pawn experiences. Interestingly, Rotter had anticipated this issue by manipulating skill versus chance variables in performance. More recently, this general model has perhaps had its most striking effect in influencing our models of health behavior. Studying the health consequences of perceptions of control-or lack of it-over illness, health, and disease variables

(described by Wallston [Chapter 5], Strickland [Chapter 2], and Frazier, Tennen, and Meredith [Chapter 8, all in this volume]) reflects the heuristic power of this type of approach.

Both major and minor daily events have the potential to influence well-being and health. Daily diary studies show that reporting events as stressors is associated with declines in negative affect and increases in positive affect (Almeida, 2005) and that major life events influence well-being (see Infurna & Luthar, 2016; Lucas, 2007). However, we argue that events can be examined more closely with their level of controllability. For example, some of these events, especially at the daily level, can be controllable (as when someone overdraws his bank account) or not controllable (as when someone hits your car in the parking lot). Furthermore, daily events are not only negative, but also involve positive events occurring in the form of a deep and meaningful conversation with a loved one, a co-worker bringing in food to the office, or a friend surprising you with a gift.

A third avenue through which perceived control can be examined further is in the context of major life stressors. Major life stressors are events that result in a qualitative shift in one's life circumstances (Hultsch & Plemons, 1979). Examples include acute-onset stressors such as cancer diagnosis, spousal loss, or unemployment, as well as chronic stressors that include childhood abuse and growing up in poverty. These stressors can have severe implications for functioning across domains such as wellbeing, health, and social relationships (Infurna & Luthar, 2016). Perceived control can play a vital role in helping individuals overcome major life stressors. For example, Infurna and colleagues (Infurna, Rivers, Reich, & Zautra, 2015) found that individuals who reported more childhood abuse were more emotionally reactive to daily negative and positive events in midlife, and that higher levels of perceived control increased one's sensitivity to emotional reactivity. Shelley Taylor's research in patient populations has shown the effectiveness of reported higher levels of perceived control on adjustment (Taylor, Kemeny, Reed, Bower, & Grunewald, 2000). Furthermore, Ranchor and colleagues (2010) found that, in cancer patients, those who were able to maintain perceived control despite the

diagnosis showed less psychological distress in the years thereafter (see also Infurna, Gerstorf, & Zarit, 2013).

Given these impressive lineages, we believe that a fruitful avenue for future research is to examine the role that control variables in both the person and in the environment can play in shaping the course of daily lives. This requires the separate assessment of experienced controllable and uncontrollable daily negative and positive events. For instance, if events are cross-categorized as controllable or uncontrollable but also as positive or negative (Reich & Zautra, 1983, 1984; Reich, Zautra, & Hill, 1987), self-caused positive events are significantly related to positive outcomes, but externally caused positive events are also related to negative affect, showing that event control effects can outweigh event valence (Strand, Reich, & Zautra, 2007). We conclude that personal mastery (Pearlin and Schooler's scale: 1978) has sensitizing effects when assessed in light of a person's environment of controllable and uncontrollable positive and negative events. People with high mastery beliefs are made more reactive to the positive effects of positive events and controllable events, but are also highly reactive to the negative effects of both uncontrollable negative and uncontrollable positive events. This pattern does not appear in people who report lower personal mastery beliefs; those who feel less personal control in their lives are not as highly responsive to a world of events over which they feel less personal control in the first place.

In sum, a rich new approach to perceived control appears on the horizon if we lift our sights to studying not only personal control beliefs in all of their variety (Skinner, 1996), but also simultaneously assess the environment of events in which people with varying control beliefs conduct their lives. Those events carry different types of valence and different degrees of personal controllability, so further study would illuminate the relationships between both domains of causation. As Ken Wallston has reiterated in Chapter 5 of this volume, "the action is in the interaction." It may well take another 50 years to learn all that we can about this more complex picture of well-being.

Aging, control, and longitudinal methodology. The evidence now seems compelling enough to at least tentatively conclude that the

"one-size-fits-all" model of the all-encompassing positive power of high degrees of belief in one's personal control may be inadequate, if not inaccurate, to explain the data obtained from recent studies. Robinson and Lachman (Chapter 9, this volume) have described this as "the downside of control," with evidence coming from many areas of investigation. There are both conceptual and methodological reasons why it now appears that some rethinking is needed of the near-universal belief that high levels of personal mastery are, inevitably and invariably, a positive cause of positive well-being. Stemming from Skinner's (1996) landmark paper and reviewed again by Skinner in Chapter 13 of this volume, empirical studies are demanding a rethink of this construct. We proposed earlier that we need to investigate more thoroughly how personal beliefs match the environment in which the person engages in daily living. Those beliefs may well change in character depending on the events that the person experiences, as well as on other properties of the person, especially his or her age.

New research since Rotter's initial work has made it clear that control beliefs are not stable, at least when considered over the full course of the life span. A majority of research examining the effect of perceived control across a wide range of outcomes, such as disease, disability, and mortality, has primarily focused on one-time assessments. We feel that it is just as important to focus on how changes in perceived control are linked to meaningful outcomes across the life span. Changes in perceived control can signify meaningful shifts in one's belief system and expectations in one's contextual surroundings (Infurna, Ram, & Gerstorf, 2013). Previous research found that more positive rates of change in perceived control over a 16-year period is protective against 19-year mortality risk (Infurna, Ram, & Gerstorf, 2013). More recently, we found that the beneficial effects of change in perceived control are contingent on one's levels of functional limitations, depressive symptoms, and emotional support (Infurna & Okun, 2015).

Are there situations when it is best to relinquish control and utilize other strategies? The research of Heckhausen and colleagues has examined this idea, which they describe in each of their chapters in this volume. For example, Hall and colleagues (Hall, Chipperfield, Heckhausen, & Perry,

2010) found that individuals with more chronic health problems but who reported more goal disengagement were more likely to survive nine years. Infurna and Okun (2015) recently investigated situations in which there are benefits but also drawbacks to reporting high levels of perceived control. They found that positive rates of change in perceived control protected against mortality risk for those with fewer functional limitations and depressive symptoms and more emotional support. It may be that, in the context of high functional limitations, striving for control or changing one's environment is maladaptive, and utilizing other strategies, such as secondary control, may prove more beneficial. Furthermore, Specht and colleagues (2011) found that a high level of internal control was associated with stronger declines in life satisfaction when experiencing the loss of one's spouse but a quicker recovery, whereas high levels of external control beliefs were associated with less steep declines in life satisfaction when experiencing the loss of one's spouse but slower recovery in the years thereafter. These themes are elaborated upon in several chapters in this volume (e.g., Villareal & Heckhausen [Chapter 11]; Robinson & Lachman [Chapter 9]; Barlow, Wrosch, Heckhausen, & Schulz [Chapter 12]).

All the same, a number of questions are not yet clearly answered. For example, Grob, Little, and Wanner (1999) showed that the effects of control must be measured by different techniques largely because the effects of control vary over the life span; control can be conceptualized as an expectancy for control because striving for goals varies by the age of the person making the judgments. In turn, these constructs have differing effects at varying levels of age. Evidence is quite inconsistent as to whether control beliefs change over longer term development. There appears to be a negative correlation between age and control, but the relationship is not linear and it depends on the type (domains) of control being assessed (Grob et al., 1999; Wolinsky & Stump, 1996; Wolinsky, Wyrwich, Babu, Kroenke, & Tierney, 2003). As for the age and well-being relationship, some studies show that age and well-being are positively correlated (Lachman & Agrigoroeai, 2010), but additional studies find a number of important qualifications to a direct relationship (Lachman, 2006). Methodologically, studies in which age is a variable should make attempts

to handle the complication of separating out aging processes from cohort effects (Wolinsky & Stump, 1996), a complication that represents a strength of the new information that we have gained since the original perceived control studies.

In summary, a majority of research examining perceived control has primarily focused on one-time assessments. We feel that it is becoming increasingly clear that longitudinal designs are going to become central assessment methodologies to answer the questions that investigators are asking. For example, a body of studies in the life span tradition is seeking to determine the relationships among control, age, and changes in control and aging outcomes, including longer term well-being, cognitive functioning, physical health, and longevity. These types of questions initially received a good deal of attention in the seminal volume entitled The Psychology of Control and Aging by Baltes and Baltes (1986). We have learned a lot since then, as the chapters in this volume demonstrate, but some fundamental questions raised at that time are still with us. Fortunately, we have more data from longitudinal studies that are being brought to bear on these key processes. It is now appropriate for the field to turn its attention to this more complex but more productive way of doing our science. Thus, future studies must have the important caveat that they should build in methods that at least sample different age levels, if not formally apply classical longitudinal models of multiple, across-time repeat sampling of variables for the same person (including reassessments of control beliefs as they pertain to both the person and the person's environment of variables).

New models of interventions. Given all the new questions and answers about perceived control that are forcing revisions to our classical models, these developments may well lead to revisions in our tradition of developing interventions for enhancing personal control beliefs and behaviors. The early and by-now classic intervention studies by Langer and Rodin (1976), Rodin and Langer (1977), and Schulz and Hanusa (1978) established a relatively small but highly influential body of evidence that control beliefs can be manipulated (enhanced), as can, to some extent, behavior techniques (see also Baltes, 1995). Reich (2015) summarized the dozen studies following from the original studies and that now form a

distinct body of research as a core of findings in this intervention tradition. That review shows that all these studies showed positive benefits for such basically psychoeducational techniques. That tradition has been continued into this volume by the work of Frazier, Tennen, and Meredith (Chapter 8, this volume) and Robinson and Lachman (Chapter 9, this volume).

There are two major recent developments that bode well for expanding the range and effectiveness of such interventions; given those developments, it now seems that some fundamental and productive changes are possible. One new line is conceptual, expanding our understanding of what properties of events, particularly controllability, can enhance the participant's approach to daily experiences. The second new line of intervention research takes advantage of technological advancements in the broader society.

First, the models of event causation described earlier now make it clear that the control properties of events (as well as control beliefs in the person) are a rich source of variance in accounting for well-being outcomes. One model incorporating this distinction is reported in Zautra, Davis, Reich, Sturgeon, Arewasikporn and Tennen (2012). This intervention study tested two separate models of intervention, both employing structured telephone calls to community-residing middle-aged adults daily for 30 days. One condition, the personal mastery intervention, provided suggestions for daily activities involving personally controllable versus uncontrollable positive, neutral, and negative events and also suggested control-enhancing techniques for dealing with such events. The other condition, a mindfulness meditation condition, provided mindfulness techniques for ruminating and deepening one's experiencing of daily events. Results showed positive effects for both interventions, with the personal mastery condition enhancing emotional well-being and the mindfulness condition enhancing both emotional and physical reactions. Fatemi and Langer (Chapter 6, this volume) discuss some of the major distinctions between mindfulness and personal control, and the data of this intervention study suggest that, indeed, there are important differences between these two models. Given this, intervention research now has new ways of approaching future studies.

A second line of recent developments can change the ways we do interventions. Frazier, Tennen, and Meredith (Chapter 8, this volume) report employing control-enhancing modules that are made available online to supply techniques for intervention methodology. Zautra and colleagues (2012) employed automated telephone contacts, delivered daily for 30 days, with a high degree of participant retention. Robinson and Lachman (Chapter 9, this volume) report on the effectiveness of cognitive strategies for memory improvement. This strategy of personalizing the intervention material is highly promising for future developments. Both the increased conceptual depth and technological range of applicability of control-enhancing interventions show great promise for evolving the initial thinking of the founders of this branch of perceived control studies.

CONCLUSION

In summary, the construct of perceived control has received major attention in psychological theory, research, and practice and other disciplines since its formal introduction by Julian Rotter in 1966. As shown by the impressive contributions represented in the chapters of this commemorative volume, the past 50 years have brought a great deal of knowledge about the role of one's perceptions and motivations for control in relating to measures of physical and mental health. Impressively, effective interventions have proved in practice that this way of thinking can have real influence in helping people to live better lives. Given the power of the concept of perceived control, we believe that this edited volume can become a resource on what the past 50 years of research on perceived control has contributed and also serve as a guide to the great potential for even more contributions in the next 50 years.

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Internal Versus External Locus of Control

An Early History

BONNIE R. STRICKLAND

It was the age of grand theory. In the 1950s, psychologists had returned from World War II, re-established themselves in colleges and universities, and embarked on the daunting task of developing further theories of human behavior. Moreover, it was clear that clinical psychologists were needed to provide mental health services for veterans returning from the war. Education and training standards developed during the Boulder Conference proposed the scientist-practitioner model for educating and training clinical psychologists in both research and practice. This model urged clinicians to use their empirical research to influence their applied practice while simultaneously allowing their experiences during applied practice to shape their further research endeavors.

Julian B. Rotter was a participant in the conference. He returned to the Ohio State University, where he was to become an exemplar of this model, integrating psychological theory, research methodology, and practice. In 1954, Rotter published *Social Learning and Clinical Psychology* and

proposed a social learning theory of personality. He notes that it was an attempt to synthesize the available knowledge and theorizing that preceded it and credits Kurt Lewin's firsthand influence and Clark Hull's books as impressing him with the importance and potential value of carefully articulated theory. He turned to learning theorists such as Hull, Thorndike, and Tolman and relied on Adler, Kantor, and Krech in an attempt to integrate the two extant theoretical trends in American psychology at that time: namely, the stimulus-response or reinforcement theories on the one hand, and the cognitive or field theories on the other (Rotter, 1982). This was probably Rotter's greatest achievement, although he is perhaps best known for his work on internal versus external locus of control of reinforcement.

Rotter's social learning theory utilizes three basic constructs in the measurement and prediction of behavior: behavioral potential, expectancy, and reinforcement value. The basic formula is stated: BP = f (E & RV). More specifically, it reads that the potentiality of functionally related behaviors to occur in specified situations in relation to potential reinforcements is a function of the expectancies of these behaviors leading to these reinforcements in these situations and the values of these reinforcements.

Internal versus external locus of control is an expectancy variable within Rotter's theory. Expectancy is defined as a subjective probability or contingency held by the individual that any specific reinforcement or group of reinforcements will occur in any given situation or situations. Expectancies are determined by the probability calculated on the basis of one's past history of reinforcement and by the generalization of expectancies from other behavior-reinforcement sequences.

The development of the notion of internal versus external locus of control of reinforcement arose from clinical observations. Rotter was supervising the clinical work of one of his graduate students, E. Jerry Phares. They noticed that in a client's attempts to find a job, he did not perceive any causal relationship between his behavior and the occurrence of rewards. Indeed, he seemed to believe that behaviors such as obtaining a job or asking a woman for a date were controlled by external factors rather than by any aspect of himself or his behavior. Extrapolating from this clinical