

Making Sense of Control: Change and Consequences

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Abstract

The concept of control in the social and behavioral sciences derives mainly from theories of motivation. Early work on control was largely descriptive, with an emphasis on individual differences in perceived control. This essay first reviews the foundational research on the development of control beliefs and their relationship to achievement and health outcomes. Next, the article summarizes more recent cutting-edge research, which has examined trajectories of longitudinal change and the processes and mechanisms that link control beliefs with outcomes. Studies have shown that control beliefs can be a resilience factor that buffers the effects of stress and moderates social class differences in health and longevity. Suggestions for future research directions include a focus on short-term, within-person variability and intraindividual change processes, cultural variations in control beliefs, and the antecedents of control. The article concludes by considering some of the possible limits of a high sense of control as well as interventions to optimize control, and the policy implications of control beliefs. Future research will benefit from a biopsychosocial approach in order to understand how control beliefs develop and get under the skin to affect health and well-being.

INTRODUCTION

The concept of control has its roots in theories of motivation (Weiner, 1990) as a basic human need fueled by the positive feelings associated with the accomplishment of goals and the satisfaction that accompanies agency, mastery, and success (deCharms, 1968; Rotter, 1966; White, 1959). The origins of control are manifested as the infant begins to develop an understanding of cause and effect or contingency. Parents know well the battle of whether or when to give in to a crying baby. The babies usually win, thereby learning something about control through the powers they hold in bringing about desired outcomes. William James (1890) captured this in his observation that crying children often look around to see what effects they are having on the adults around them.

Once there is an understanding quite early in life that one can be effective in getting people and things to meet needs, there is also an awareness that control can be taken away or may not always be possible. At a young age, some children learn that those around them are responsive, leading to a sense of mastery, and others come to know that their efforts are sometimes ignored, promoting a sense of helplessness. The loss of control and even the anticipation or fear of losing control are associated with many negative outcomes, such as depression (Seligman, 1975), anxiety, and stress (Dickerson & Kemeny, 2004).

Much of the research on the nature of control has focused on perceptions of control. This work has considered how perceived control develops and changes over time throughout the life course and its effects on achievement, health, and well-being (Lachman, Neupert, & Agrigoroaei, 2011). It is the perception of control rather than the degree of actual control that is consistently found to play an important role for outcomes. This approach can be traced to early phenomenological work, suggesting that attitudes, expectancies, and subjective interpretations of one's circumstances are important (Thomas & Thomas, 1928). Indeed, the notion of feeling in control has been addressed by philosophers and social scientists as an important source of happiness. Yet, how one faces seemingly uncontrollable circumstances is an important indicator of maturity and adjustment.

Until recently, much of the work on the development of sense of control had been cross-sectional, and the linkages with important outcomes such as health have been descriptive. Thanks to studies of control using short-term and long-term longitudinal designs and experimental paradigms, we are beginning to gain a clearer picture of the directional pathways and mechanisms. Recent advances show that beliefs get under the skin to make a difference for health. We review the major contributions of research on control beliefs for lifespan development and health. We then discuss some unanswered questions and consider new directions for future studies and the potential application of findings for policy.

FOUNDATIONAL RESEARCH

Control is defined and measured in multiple ways. The most basic approach captures beliefs about the likelihood of bringing about desired outcomes. It includes beliefs about one's own role in terms of abilities and effort as well as the extent to which there are constraints or obstacles that may interfere with one's goal attainment (Skinner, 1996). The measures typically are self-assessments with questions that focus on perceptions about one's own control in general or within specific domains and situations.

There is solid evidence that expectancies of control make a difference, irrespective of objective circumstances. This is in line with findings from other domains where subjective evaluations are often better predictors of outcomes than objective indicators. This is the case, for example, for self-ratings of health in comparison to doctor's reports, when predicting mortality (Idler & Benyamini, 1997).

Subjective experiences and appraisals of the situation affect behavior and make a difference for physiological responses, providing the means for beliefs to get under the skin to influence health. Although there is some work that manipulates control and attempts to understand the role of actual control, this work has been less prominent. The objective nature of control is not often possible to assess and the same situation may be interpreted in different ways. Thus, the majority of the studies focus on individual differences in perceived control, and the findings show important change patterns across the lifespan and significant associations with achievement, health, and well-being outcomes.

DEVELOPMENT OF CONTROL

During childhood, the sense of control generally increases (Skinner, 1992). It continues to rise through early adulthood and then starts a course of decline before leveling off in midlife age and declining in old age. These patterns are found in both cross-sectional and longitudinal studies; yet, there are some inconsistencies, perhaps due to the use of different measures, designs, and samples. The trajectories of change are further qualified by individual differences within age groups. For example, control beliefs in childhood may reflect experiences tied to social class differences, which can be perpetuated across the life course with long-term consequences for health and well-being. Developing a sense of control, by learning to positively reframe circumstances and persist despite adversity, may alter health trajectories in adulthood (Chen, Miller, Lachman, Gruenewald, & Seeman, 2012).

Piecing together the full trajectory of control over the life course is not clear cut as most studies do not include a large age range. There is some evidence of a decline in control in early adulthood (Lachman, Rosnick, & Röcke, 2009; Mirowsky, 1995; Vargas-Lascano, Galambos, Krahn, & Lachman, under review). Adolescents and young adults tend to have a high, perhaps unrealistic, sense of their control and may feel invulnerable. This may lead them to engage in risky behaviors, yet it also can be an advantage in their expansive goal pursuit. Sense of control may be dampened somewhat after graduating high school or college when facing the challenges and demands of adult tasks or disappointments, or in response to other salient experiences or environmental factors. We identified two different paths in adulthood

that vary as a function of parental education (Vargas-Lascano *et al.*, under review). Among children whose parents had a college degree, sense of control was maintained throughout early adulthood. In contrast, children whose parents were not college educated showed declines in their sense of control throughout adulthood.

Throughout the adult years, experiences of both gains and losses are sources of control beliefs. Gains in control come from acquiring experience, developing mastery, or reaching a peak of knowledge, competence, and expertise. In later life, the sense of competence is maintained in many domains (e.g., work or home) due to accumulated experience or the fact that adults select situations in which they feel efficacious and in control. Control declines are tied to obstacles and limitations, including unexpected or uncontrollable events and constraints that increase with age (e.g., bereavement, health conditions, loss of social roles). Beliefs in constraints increase in the context of physical and cognitive declines and other losses associated with aging.

Among the first to consider control in the context of aging, Langer and Rodin (1976) manipulated control within a nursing home setting by giving the experimental group care of a plant and the opportunity to choose the times to attend movies. In contrast, the comparison group had their plant cared for by the staff and was told when to attend movies. They found important increases in health and well-being for the experimental group, although the expected effects on mortality fell short. Notably, they did not report findings for differences in perceived control. Thus, it is not clear if the treatment group experienced increased control or if there were individual differences in this perception. For some individuals, being told to take care of a plant could have led to lower perceived control, especially if that is not something they wanted to do. Another early study (Schulz & Hanusa, 1978) manipulated control by giving older adults choice as to when and how long student volunteers would visit. Although initially there were psychological benefits, the group who was given control showed long-term negative consequences when the students left for summer vacation. This was one of the first demonstrations of the damaging effects of losing control.

Control over aging is to a large extent about the degree to which one believes it is possible to delay, reduce, or avoid declines, although it is also about opportunities for enhancement or optimization. Low control is reflected in the belief that declines are inevitable and irreversible and that there is not much you can do about it. This mindset has tremendous implications for how one behaves and ultimately for happiness, health, and longevity.

CORRELATES AND CONSEQUENCES OF CONTROL

Although there are conceptual and measurement differences in the construct of control, there are some consistent themes about relationships with achievement and health. A sense of control makes a person happy, healthy, wealthy, and wise (Lachman *et al.*, 2011). Indeed, many studies have found that those with a higher sense of control have higher psychological well-being, better health, a greater income, and higher levels of cognitive functioning. Much of this work, however, has been correlational, and there is not a clear sense of directionality, causality, or underlying mechanisms, although recent studies have shed some light.

CUTTING-EDGE RESEARCH

MECHANISMS OF CONTROL

How do control beliefs influence outcomes? Although the earliest work focused on the notion of a self-fulfilling prophecy as a possible explanation, more recent work demonstrates how beliefs impact actions and reactions. Some of the mechanisms that can account for the associations between control beliefs and aging-related outcomes have been identified in a number of recent studies, and do not seem to be specific to one particular age group. The mediators of the relationship between control and achievement in the cognitive domain include strategy use, anxiety, distractibility, and intrusive thinking (Lachman & Agrigoroaei, 2011). Those with higher control use more effective problem-solving strategies, are less anxious, and are more task-focused. For health, strong beliefs in control lead to more health-promoting behaviors such as exercise, healthy diet, and preventive care. The underlying theme is that those who feel in control are more likely to take adaptive actions and use effective strategies to bring about desired outcomes. Moreover, control is associated with adaptive stress and immune responses that are protective for health. Expectancies get under the skin (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002), and how one appraises a situation with regard to its controllability has implications for stress. Low controllability is a primary source of stress, which in turn can have damaging consequences for health (Lachman, 2006). Thus, a lack of control has physiological consequences for stress hormones, inflammation and other biological factors related to health (Turiano, Chapman, Agrigoroaei, Infurna, & Lachman, 2014; Turiano, Lachman, & Chapman, 2014).

CONTROL AS A RESILIENCE FACTOR

Protective psychosocial factors, such as having a higher sense of control, can buffer the negative effects of stressors or daily challenges. In particular,

individuals with lower perceived constraints are less emotionally and physically reactive to daily interpersonal stressors (e.g., argument) and individuals with a high sense of mastery are less physically reactive to work stressors and less emotionally reactive to network stressors (Neupert, Almeida, & Charles, 2007).

Marmot (2002) suggested that autonomy and controllability are key factors that account for the social gradient in health. Those in lower status jobs often have less control over their work life and this can have damaging effects on their health, including physiological markers of inflammation such as fibrinogen (Brunner *et al.*, 1996). Although those in low socioeconomic status (SES) groups typically have a lower sense of control, some do develop a high sense of control. A strong sense of control can buffer the negative effects of lower SES. This is promising in that it suggests that appraisals of life circumstances can make a difference and can help to counteract the deleterious effects of low income or low education. SES differences in health and even mortality risk can be reduced or even eliminated by a strong sense of control (Lachman & Weaver, 1998; Turiano, Chapman, *et al.*, 2014).

CONTROL IN THE EYE OF THE BEHOLDER

Although much of the research on control has focused on subjective assessments, there is also some interest in understanding the role of objective circumstances by assessing perceived control in the context of manipulated control (Agrigoroaei, Polito, *et al.*, 2013; Bollini, Walker, Hamann, & Kestler, 2004). In some cases, participants have an illusion of control, thinking, and behaving as if they can influence outcomes, when in fact they cannot. We examined perceived control in relation to manipulated control using a driving simulation paradigm (Agrigoroaei, Polito, *et al.*, 2013). The experimental condition with low controllability was programmed by simulating windy and slippery conditions, so that steering and braking were difficult. In contrast, the normal controllability condition involved regular driving conditions. Those in the low-controllability condition reported lower control than the normal condition, confirming that the manipulation had the desired effect. We examined whether low controllability had consequences for a stress response measured with the salivary cortisol. The effects of the experimental condition, however, depended on general control beliefs. Participants who had a high general sense of control had a larger stress response in the low-controllability condition, perhaps because it was contrary to their typical experiences. Their heightened stress response may be indicative of vigilance and compensation for the low control stressor and indeed, for these individuals, there were no negative consequences of stress for driving or cognitive performance. In daily life, those with high control

typically select into high control situations and we do not often see the consequences of incongruent control. This work provides further support for the importance of subjective appraisals of control.

CONTROL AND HEALTH

There is evidence that those with higher control beliefs have better health. Recent work with longitudinal designs has helped to disentangle the cross sectional findings. There is emerging evidence that control beliefs lead to changes in health (Infurna, Gerstorf, & Zarit, 2011). Nevertheless, it is also likely that those with better health feel more in control, whereas becoming ill can lead to decreases in the sense of control (Gerstorf, Röcke, & Lachman, 2011). A high sense of control seems to have anti-inflammatory properties (Turiano, Lachman, *et al.*, 2014) in that the relationship between control beliefs and health is mediated by a lower level of IL-6, a marker of inflammation. Control beliefs are also related to mortality risk (Infurna, Ram, & Gerstorf, 2013; Turiano, Chapman, *et al.*, 2014). Those with a lower sense of control have a greater probability of earlier death. Although it is not possible that death itself affects control beliefs, there are alternative possible explanations and knowing more about the cause of death would shed additional light on the nature of the relationship and possible mechanisms. Understanding the time-ordered processes involving control and health may suggest appropriate targets and timing for interventions.

KEY ISSUES FOR FUTURE RESEARCH

How is it that the same situation is perceived as controllable by some and not others? This fundamental distinction in perceptions or beliefs systems makes a difference in many life domains. This is not a matter of optimism or seeing the glass half full. Rather beliefs about controllability capture the expected impact of one's own agency, with implications for behavioral, physiological, and emotional responses (Bandura, 1997). Further research from a biopsychosocial perspective is needed to understand the processes involved as this may lead to promising insights and interventions. We provide some suggestions for future directions.

WITHIN-PERSON VARIATION

Although much of the work on control examines differences between persons or changes over the long run, there is emerging evidence that control fluctuates over the short run within individuals. Moreover, irrespective of the level of control, higher stability (lower fluctuation) in control beliefs is

associated with lower mortality risk (Eizenman, Nesselroade, Featherman, & Rowe, 1997) and better cognitive performance (Agrigoroaei, Neupert, & Lachman, 2013). Of interest for future research is how to promote the maintenance of control in the face of challenge, adversity, uncertainty, and change. It will also be useful to understand the associations of control and well-being in the context of daily functioning using frequent assessments such as experience sampling with an explicit focus on intraindividual variability and change.

CULTURAL VARIATIONS

Is a high sense of control universally beneficial? There is some evidence that Americans are not only higher in control but also that control may be more strongly tied to well-being, compared to other countries. Advertisers are well aware of the appeal of being in control, as they often use the familiar dictum “take control” to promote their products. The Pew Research Center study of control beliefs around the world showed the United States had the largest proportion believing they are in control of life outcomes (Lachman, 2006). Work by Kitayama and colleagues (2010) has shown that the Japanese and Americans on average have similar levels of control beliefs, yet they are not as important for well-being in Japan, as they are in the United States. In Japan, supportive social relations contributed the most to well-being rather than control. More work is needed to explore the nature and benefits of control across cultures and ethnic groups within and across nations to understand the role of contextual factors.

THE OTHER SIDE OF CONTROL

Although much work points to the benefits of control, an interesting question is whether having a high sense of control can also be damaging in some circumstances. Indeed, control may be a double-edged sword. Those who have a high sense of control may be more likely to ignore realities of health problems or assume they are not susceptible to aging-related changes. One possible implication is that those with a high sense of control may ignore symptoms or not go to the doctor regularly. Research is beginning to explore whether those with high control are more likely to have undiagnosed or untreated conditions, such as hypertension or diabetes.

There is a paradox in that those who feel in control often do not accept help from others or may not want to use environmental supports even if it would be beneficial, on the one hand. On the other hand, mobilizing support from others or making use of assistive devices to maintain one’s well-being and lifestyle are effective means to increased control. Further work is needed to

understand the role of control beliefs in the adoption of compensatory new technologies (e.g., automated medication reminders, robots). The adoption of some automated systems (e.g., self-driving cars), which turn individuals from active agents to passive observers, may come at the expense of personal control and the maintenance of skills.

SOURCES OF CONTROL BELIEFS

Much of the work has focused on the consequences of control beliefs, and less is known about the etiology of individual differences in control. Bandura (1997) suggested that a sense of control is tied to past experience and feedback from others. Control beliefs can develop as a result of aging stereotypes about helplessness (Levy, 2003). Thus, older adults' lower control beliefs may reflect the internalized negative views of aging shared by the society.

Social support engenders a sense of control. Knowing you can call on others if needed gives one a greater sense of mastery and control (Antonucci, 2001). There are indications that education influences control (Mirowsky & Ross, 2007) by learning that one can respond in effective ways by acquiring the skills to address problems that arise. Alternatively, it is possible that those with a higher sense of control select into higher education. Indeed, we found that those with higher control in high school were more likely to pursue higher levels of education (Vargas-Lascano *et al.*, under review). Understanding the etiology of beliefs in control will be an important avenue for future study, with implications for promoting adaptive beliefs throughout life.

INTERVENTIONS TO OPTIMIZE CONTROL

There is some evidence that control beliefs can be changed (Lachman *et al.*, 2011). This has implications for understanding how we can promote control, or accept the limits of control when appropriate. Victor Frankl's (1963) statement, written while in a concentration camp, captures this theme well: "The last of human freedoms—to choose one's attitude in any given set of circumstances" (p. 104). If one cannot choose one's circumstances then, ultimately, control is about choosing how to interpret and respond to one's circumstances. Attitudes and beliefs can be adaptive in the face of great adversity by providing a means to do something to deal with or accept one's plight or to move on. Some interventions have focused on cognitive restructuring as a way to reframe seemingly uncontrollable circumstances (Lachman *et al.*, 2011). Other ways to increase control focus on increasing choice, flexibility, support, and emotion regulation.

The work place represents a relevant context for control interventions. Marmot has shown that low control at work can be damaging for health. The job strain model (Karasek & Theorell, 1990) posits that occupations associated with low job control and high job strain (the combination of lower control

and higher demands) are more stressful and thus more detrimental for health outcomes, including a greater risk of vascular dementia (Andel *et al.*, 2012). There has been much interest in providing more flexible work situations. This would entail such features as choice of work tasks and the ability to juggle schedules. As shown by Moen and colleagues (2011), programs that allow employees greater work-time control have benefits in terms of lower turnover rates.

There are a number of theories that suggest ways to take control through self-regulatory strategies. Selective Optimization with Compensation (Freund & Baltes, 1998) and the Lifespan Theory of Control (Heckhausen, Wrosch, & Schulz, 2010) provide frameworks for promoting control within the context of aging-related declines in health and cognition. These involve reducing demands, compensating for losses, and knowing when to disengage from goals in the face of limitations. Future work that examines to what extent these strategies can be taught would be a valuable contribution. The role of control beliefs for self-control processes involving emotion regulation and health-promoting behaviors (e.g., exercise) is a promising avenue for further exploration.

POLICY IMPLICATIONS OF CONTROL BELIEFS

Not only is an understanding of control beliefs relevant for health and well-being outcomes across the lifespan but personal beliefs about control also have implications for policy in a number of areas including civic engagement and utilization of health services (Mallers, Claver, & Lares, 2014). To the extent that individuals feel a higher sense of control, they may have greater interest in active engagement such as voting and volunteering within their communities. Moreover, control beliefs can influence participation in self-care as well as use of health services. Therefore, a greater understanding of factors that influence control across the lifespan may not only be associated with greater well-being for an individual but may also have implications for health care and policy at the societal level.

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FURTHER READING

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Webpages:

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<http://www.brandeis.edu/lifespaninitiative/>

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Elizabeth H. Rickenbach, PhD was a postdoctoral research fellow in the Lifespan Developmental Psychology Laboratory at Brandeis University. In 2012, she received her doctoral degree in Aging Studies at the University of South Florida. She serves as Chair-Elect of the Emerging Scholars and Professionals Organization of the Gerontological Society of America, and postdoctoral representative to the Executive Committee of Division 20 of the American Psychological Association. Her research is focused on using interdisciplinary methods to examine daily experiences of stress and coping in the context of cognitive aging in middle and older adulthood, and examining risk factors for cognitive decline such as stress and sleep disruptions. Her work utilizes multiple methods, including short-term repeated measures designs (e.g., daily diary studies) to examine everyday factors contributing to health and well-being, as well as longitudinal methods to examine long-term change. In September 2014 she took on a new position as an Assistant Professor of Psychology at Saint Anselm College in Manchester, New Hampshire.

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