

The Grace of Control:  
How A Can-Control Mindset Increases Well-Being, Health, and Performance

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**Abstract**

Despite a substantial body of research suggesting that perceived control is a fundamental pillar of physiological and psychological well-being, interventions intended to directly increase perceived control are limited. In the current research, we propose that simply directing one's focus on what one can control, i.e., adopting a can-control mindset, can increase an individual's psychological and physiological well-being. We conducted two experiments with longitudinal designs. Experiment 1 used a longitudinal design and showed that a bi-daily can-control reflection period increased Subjective Well-Being (SWB) two-weeks later and reduced health symptoms 7-months later. Experiment 2 demonstrated that the can-control mindset intervention produces changes in objective sales performance over time; this study also established discriminant validity – the effects of the can-control mindset intervention were greater than, and distinct from, a positive mood intervention. Across the two longitudinal experiments, the effects of the control manipulation were fully mediated by changes in optimism and not by changes in authenticity. Together, these results extend previous research on the importance of perceived control and suggest an attainable intervention for increasing perceived control. The experiments demonstrate that the well-being, health, and performance effects need not be produced by changing actual or illusory control but can instead be produced through meaningful shifts in one's mindset.

**Keywords:** control, optimism, subjective well-being, authenticity, intervention

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“When we are no longer able to change a situation, we are challenged to change ourselves.” ~Victor Frankl

In August of 1979, 52 Americans were taken hostage when supporters of the Iranian Revolution stormed the American Embassy in Tehran. The hostages suffered hunger, torture and isolation over their 444 day captivity; however, many of them reported that the loss of control over their daily lives was the most painful experience of all. Those who fared best psychologically found clever ways to reorient their focus to any sliver of control that remained. John Limbert, a young foreign-service officer, for example, adopted a unique mindset when prison guards came to interrogate him: “They became *my* guests...I created the unmistakable sense that this was *my* space, *my* territory, and it did wonders for my well-being” (Segal, 1986, p. 99).

Limbert’s account is an intriguing demonstration of the robust psychological tenet that perceived control can improve well-being even in the face of unbearably harsh circumstances. Indeed over 50 years of psychological research has demonstrated that perceived control is a strong predictor of physical and mental well-being (Bandura, 1989; Lachman & Burack, 1993; Langer & Rodin, 1976; Lefcourt, 1982; Rodin, 1986; Seligman, 1975; Skinner, 1996; Strickland, 1989; Thompson & Spacapan, 1991). When people believe they have control, they display greater optimism, sustained attention, problem solving, action, and persistence in the face of failures and setbacks. Individuals who believe they are in control are less anxious and depressed in the face of chronic illness (e.g., Griffin & Rabkin, 1998), less traumatized by victimization (Regehr, Cadell, & Jensen, 1999), and more productive in their workplace, especially during times of threat and uncertainty (Brockner, Higgins, & Low, 2004). Conversely, when people believe they lack control, they become fearful, depressed, pessimistic, distressed and

demonstrate withdrawal and passive behaviors. In contrast, the perception that one lacks control leads individuals toward depression, pessimism, and withdrawal from challenging situations (e.g., Peterson & Seligman, 1984); are often drawn to superstitions (Whitson & Galinsky, 2008); and are more at risk of untimely mortality (Infurna, Gerstorf, Ram, Schupp, & Wagner, 2011). This is especially true in western cultures where the value of control is most prominent (e.g., Cheng, Cheung, Chio, & Chan, 2013).

A key finding from the control literature is that perceived control is often a more powerful predictor of functioning than actual control (Averill, 1973, Burger, 1989; Weems & Silverman, 2006). A person's perception and belief that control is available is sufficient to mobilize action and modulate arousal, even in circumstances in which no objective control is available (Averill, 1973). Studies show that having high perceived control in objectively uncontrollable or chance-determined situations, known as the illusion of control (Langer, 1975), produces effects similar to actually having control (Averill, 1973). Similarly, research shows that having positive illusions is a pillar of mental and physical health (Taylor & Brown, 1988). Conversely, perceived lack of control produces helplessness deficits, even in situations in which control is abundant (Abramson, Seligman & Teasdale, 1978). Research on learned helplessness describes the cognitive, motivational, and emotional deficits that occur even in objectively controllable situations (Seligman, 1975).

### **Past Approaches to Increasing Perceived Control**

Despite the substantial body of research supporting perceived control as an important foundation of physiological and psychological well-being, interventions intended to increase perceptions of control are not as targeted as one might expect. Existing interventions include programs that bolster coping skills, programs that directly offer people control or encourage

people to take more control, and programs that train individuals to make attributions to controllable factors. These interventions have had success in certain situations and with certain populations but they are often lengthy and time consuming, typically targeted only at the chronically ill or underprivileged. They are rarely streamlined; instead they offer a hodgepodge of different programs, making it difficult to tease out the most active and effective ingredients necessary to increase perceived control. Moreover, the few programs that do focus on shifting or training attributions rely on actively changing people's minds about what is and what is not controllable, a difficult and often taxing process. In short, while existing interventions have had some success, room for improvement and innovation certainly exists, specifically around targeting perceived control and increasing it quickly and effectively.

Perhaps the most common interventions that have suggested the important role of changing perceived control are based off of behavioral change theories. For example, interventions based on social cognitive theory (Bandura, 1997), protection motivation theory (Rogers, 1961), transtheoretical model (Prochaska & DiClementa, 1982), and the theory of planned behavior (Ajzen, 1991) may indirectly influence perceived control as part of the process toward changing behavior. However, any change in perceived control that these interventions elicit is indirect, haphazard, delivered only for a limited population and only with a significant investment of time and resources.

For example, the most common behavioral change and coping skills interventions to date have targeted clinical populations suffering from ailments such as arthritis, cancer or other physical or mental illness (Cunningham, Lockwood, & Cunningham, 1991; Telch & Telch, 1986). These programs offer an amalgam of components intended to increase well-being, health and functioning. One study offered rheumatoid arthritis patients a 12-month pain management

program, which included trainings in problem solving, relaxation, attention diversion, family dynamics, and communication. The program led people to feel significantly more competent in their ability to manage pain (Parker et al., 1988). Another study on arthritis patients utilized six two-hour teaching sessions over six weeks, which covered self-management, exercise, pain management, nutrition, community, and goal setting. After six weeks patients demonstrated significant increases in arthritis self-efficacy, cognitive symptom management, communication with doctors, and relaxation (Barlow, Turner, & Wright, 1998). A few studies have focused their intervention on cancer patients, offering a coping skills instruction program which taught relaxation and stress management, cognitive restructuring and problem solving, and feelings management and pleasant activity planning. The coping skills instruction program improved self-efficacy, affect, life satisfaction, communication, and coping (Telch & Telch, 1986) as well as self-efficacy, mood, and quality of life (Cunningham et al., 1991).

Again, such behavioral change intervention approaches are important and have led to positive effects in eliciting improvements in health and functioning. But they are not ideal models for targeting whether perceived control is an important driver of these effects. The interventions are complex and involve many components which makes isolating the aspects that were responsible for increasing perceived control difficult. In addition, their scope of application is small (exclusively designed for people who are in low-control situations (e.g. the chronically ill or underprivileged), and they require a large time and effort investment on the behalf of the participant (at least a 6-weeks and up to a one-year commitment to learn the various components of the intervention).

Another set of interventions, borne more directly out of existing control literature, have attempted to increase perceived control by directly offering people more control or encouraging

people to take more control in a situation. One study offered hospital patients a 20-minute information session on how to read their medical record. During the session, which took place before their regularly scheduled visit, patients were coached to ask questions and negotiate medical decisions with their patients. The researchers found that the intervention resulted in a stronger preference for taking an active role in medical decision making, increased interaction with the physician, and fewer limitations imposed by medical conditions (Greenfield, Kaplan, & Ware, 1985). Langer and Rodin (1976) increased choice and personal responsibility by giving individuals living in nursing communities more control over taking care of a plant. Results showed that these individuals had higher ratings of health, smaller decreases in mood and sociability, and lower rates of mortality. Other studies focused on the elderly community have offered classes in physical education, stress management, and nutrition to actively offer participants more control in aspects of their lives (Slivinske & Fitch, 1987). Although these interventions have been effective, they are limited in that participants must be provided with a new source of control, in hopes that it will change and effect participants outlook on control in other aspects of their life.

Finally, there are a few studies that generate illusory control to increase perceived control; for example, giving people the belief that they can control electric shocks even when they cannot (Glass, McKnight, & Valdimarsdottir, 1993). This, again, is limited because illusory control is, by definition, illusory, leading to problematic outcomes if participants find out they do not in fact have control.

A final type of control intervention that has gained traction and found success is attributional retraining, which is designed to modify causal attributions in an attempt to increase perceived control. For example, Perry and Penner (1990) showed that students could be

encouraged to attribute poor performance to lack of effort and good performance to ability and proper effort. Research on altering mindsets, and specifically work on growth mindsets, is also related, in that it sometimes serves to increase perceived control. For example, interventions on growth mindset are designed to persuade people that ability or intelligence is malleable instead of fixed. One of the effects of growth mindset interventions is increased effort beliefs (i.e. “the harder you work at something the better you will be”) (Blackwell, Trzesniewski, & Dweck, 2007) suggesting that these interventions can increase perceived control by changing people’s minds about what is controllable. These results again point to the power of shifting an individuals’ perceived control. However, even growth mindset interventions are limited because these beliefs are often deep-set, linked with core values, and re-enforced by family and environment.

Despite the robust research on the benefits of perceived control, the existing body of research on interventions to perceived control has some notable limitations. More often than not, they neglect the possibility that researchers might be able to evoke perceived control without altering objective circumstances, as in Limbert’s powerful anecdote. Existing interventions that may increase perceived control tend to be buried in an amalgam of components making it be difficult or impossible to understand the direct influence of those interventions on perceived control. Most existing interventions have been built for clinical populations (e.g. chronically ill, elderly, and other at-risk populations), are quite lengthy (e.g. six weeks to one-year), and have not been tailored to fit a population of healthy adults. Those that do alter attributions depend on changing people’s minds about things they currently see as uncontrollable, which can be difficult.

### **The Can-Control Mindset: Increasing Perceived Control Through Reflection**

In the current research, we present a novel way to increase perceived control. Our method is targeted, does not depend on providing new sources of control, is not focused on clinical

populations, and does not require people to alter their actual level of control. Instead, we propose that individuals can attain perceived control simply by reflecting on what one can control versus what one cannot. We call the mindset activated by reflecting on what one can control a “can-control mindset” and the mindset activated by reflecting on what one cannot control a “can’t-control mindset”. We propose that adopting a can-control mindset will produce positive effects on well-being, health, and job performance, whereas a can’t-control mindset will diminish these outcomes.

A *mindset* is defined as a mental frame or lens that selectively organizes and encodes information. Thus, mindsets orient individuals toward a particular way of understanding their experience and guide them toward mindset-consistent actions and responses (Dweck, 2008). Although mindsets are defined as a *selective* focus on reality, their effects hinge on their ability to become self-fulfilling over time. Research suggests that a mindset has downstream effects on judgment (Taylor & Gollwitzer, 1995), evaluations (Gollwitzer, 1999), and behavior (Galinsky, Gruenfeld, & Magee, 2003). For example, altering one’s mindset about intelligence – seeing it as alterable, as opposed to fixed – increases motivation and improves GPA (Blackwell et al., 2007). Similarly, activating a high-power mindset affects behavior, cognition, and social perception (for a review see Galinsky, Rucker, & Magee, 2015). Mindsets affect health at the physiological level as well: hotel room attendants who adopted a mindset that their work represents a form of exercise showed significant reductions in weight, body mass index (BMI), and systolic blood pressure (Crum & Langer, 2007). Finally, employees who focused on the enhancing benefits of stress experienced better health during the stress of organizational downsizing than did employees focused on the debilitating effects of stress (Crum, Salovey, & Achor, 2013).

We propose that mindsets offer a promising method to alter perceived control for three reasons. First, mindsets can be changed by simply orienting one's attention to a particular subset of information through selective information or targeted reflection (e.g., Crum et al., 2013; Schumann, Zaki, & Dweck, 2014). For example, simply reading a newspaper article about the nature of intelligence can change people's mindsets around whether intelligence is fixed or malleable (Dweck, 2008) and reflecting on a time in which one had power produces a high-power mindset (Galinsky et al., 2003). Second, interventions designed to alter a mindset do not require changes in the objective situation. Creating a mindset around the enhancing nature of stress can improve the effects of stress without changing the actual amount of stress (Crum et al., 2013). Third, mindset shifts are not illusory in nature, but rather a selective integration of an already existing subset of data from which to make assumptions and motivate behavior. Stress has both debilitating and enhancing qualities, we are in positions of both high and low power, and intelligence has both fixed and malleable qualities, but one's mindset about stress, power, or intelligence can selectively orient them toward either of those truths and thereby generate self-fulfilling properties overtime (Walton, 2014).

Building on the literature on mindset change, we propose that inducing a can-control mindset will significantly improve health, well-being, and performance in the absence of any objective changes in reality or behavior. In the current research, to create mindsets related to control, we asked participants to selectively focus on what they can control versus what they cannot control. We also explore the underlying role of two potential mediators—optimism and authenticity—in linking a can-control mindset with subjective well-being (SWB).

### **Can-Control Mindset → Well-Being and Performance: The Role of Optimism**

The current research explores the mechanisms by which control-related mindsets will affect well-being. In our review of the literature, we found two constructs that were strongly linked with well-being and performance: optimism and authenticity (e.g., Scheier & Carver, 1985; Wood, Linley, Maltby, Baliousis, & Joseph, 2008; Kifer, Heller, Perunovic, & Galinsky, 2013). Optimism is defined as the extent to which individuals have positive expectations for the future (Scheier & Carver, 1985). Authenticity is defined as the degree to which individuals believe they are connecting with and enacting their “true selves” in various situations (Deci & Ryan, 1985; Rogers, 1961).

There is reason to believe that both optimism and authenticity could be mediators of the relationship between a can-control mindset and SWB because both are plausibly connected to the experience of having control. Past research has found a link between control and optimism (Scheier, Carver, & Bridges, 1994). When people feel they can control situations or events, they are more likely to have higher self-esteem and more optimistic view of their abilities to deal with stress (Bandura, 1992; Maddux, 1991). Power, which relates to the experience of control, has been shown to increase authenticity. Power increases feelings of authenticity by reducing dependence on others for acquiring and maintaining resources (Keltner, Gruenfeld, & Anderson, 2003). As a result, the powerful behave more consistently with their traits and desires (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008; Keltner et al., 2003) and experience greater feelings of authenticity in social interactions (Kifer et al., 2013; Krauss, Chen, & Keltner, 2011).

Taken together, both optimism and authenticity are plausible mediators of the relationship between control mindset and key outcomes (i.e., SWB, health, and work performance). Thus, we measure both optimism and authenticity in the two studies to test the precise mechanism in the effects of a can-control-mindset.

### **Research Overview**

In the current research, we propose that a can-control mindset can increase well-being, health, and work performance. We further propose that optimism and authenticity may mediate the effects of a can-control-mindset. Based on these, we propose our initial model that a can-control-mindset leads to optimism/authenticity which then produces SWB, physical health, and work performance.

To test this model, we conducted two longitudinal studies. We used longitudinal designs to measure changes in SWB, optimism, and authenticity over time and to separate our manipulations of mindset temporally from our measures and our mediators. In Experiment 1, participants reflected on aspects of their lives either they could control or they could not control for two weeks. Before and after the two-weeks intervention, we measured participants' SWB to explore the impact of a control-mindset intervention on psychological well-being over time. We also measured participants' physical well-being 7-months later. Experiment 2 was a field experiment in which sales employees participated in a similar longitudinal design; this study examined how evoking a can-control mindset affects not only employees' SWB but also their performance at work.

In all two studies, we measured both optimism and authenticity to test whether they mediated the link from control mindsets to well-being and performance. Overall, these studies allowed us to test whether a subtle change in mindset altered psychological and physical states as well as work performance over time.

#### **Experiment 1: Longitudinal Effects on SWB and Physiological Health**

There are three goals in Experiment 1. The first goal is to test whether adopting a can-control mindset improves SWB over time. The second goal is to explore the underlying

mechanism on the effect of a can-control mindset on SWB, by measuring both optimism and authenticity. The third goal is to examine whether a can-control mindset intervention evokes changes beyond SWB, such as physiological health. Given the established relationship between optimism and physiological health (e.g., Scheier & Carver, 1985; Conversano et al., 2010), we reasoned that if a can-control mindset intervention effectively evoked changes in optimism, it was likely to evoke long-term changes in physiological health, in addition to SWB/psychological health.

To test whether a can-control-mindset intervention can evoke long-term changes in physiological and psychological health, we conducted a longitudinal experiment that measured subjective well-being and our two mediators both before and after a 13-day intervention. We also measured participant reports of their health 7-months after the intervention (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011; Lyubomirsky, Sousa, & Dickerhoof, 2006). This allowed us to investigate the long-term durability of the changes in well-being as well as the long-term influence on physiological health.

### **Participants**

Seventy-one participants (28% male,  $M_{\text{age}}=20.9$  years,  $SD=.85$ ) were recruited from an online university pool and randomly assigned to a can-control or cannot-control mindset condition. They completed the post-intervention assessment on day 13 and a total of 35 participants completed the 7-month follow-up.

### **Experimental Manipulation**

Participants in the can-control mindset condition were asked to identify two things that they could control in their life and to compare these two examples. Participants in the cannot-control mindset condition identified two things that they could not control and compared them.

We had participants recall and compare two examples because research shows that comparisons increase the internalization of a concept (Thompson, Gentner, & Loewenstein, 2000).

Because previous research suggests that asking participants to engage in happiness interventions too often (e.g., every day) leads to rote performance (Lyubomirsky, Sheldon, & Schkade, 2005), we modeled our research on the work of Lyubomirsky and colleagues and had participants complete the manipulation every other day, on Days 2, 4, 6, 8, 10, and 12.

### Measures

**SWB.** As in previous research (e.g., Sheldon & Elliot, 1999), we computed *SWB* by combining life satisfaction (SWLS) (e.g., “In most ways, my life is close to my ideal”; 1 = not at all, 7 = extremely; Diener, Emmons, Larsen, & Griffin, 1985) with Positive Affect (PA) scores and Negative Affect (NA) measures using the PANAS, which includes 10 positive (e.g., enthusiastic, excited) and 10 negative (e.g., afraid, ashamed) items (Watson, Clark, & Tellegen, 1988; 1 = not at all, 7 = extremely).

**Optimism.** We measured *optimism* using outcome expectancies (6-items; e.g., “In uncertain times, I usually expect the best”; 1 = not at all, 7 = extremely; Scheier et al., 1994).

**Authenticity.** We assessed *authenticity* using a general authenticity scale (12-items; e.g., “I live in accordance with my values and beliefs”; 1 = not at all, 7 = extremely; Wood et al., 2008).

### Procedure

The study timeline is presented in Figure 1. The first day established baseline assessments of all measures: participants completed the SWB (SWLS:  $\alpha=.88$ ; PA:  $\alpha=.86$ ; NA:  $\alpha=.79$ ), optimism ( $\alpha=.75$ ), and authenticity ( $\alpha=.86$ ) measures.

Next, participants in the can-control-mindset condition were asked to write about two things that they could control in their lives and to compare these two examples. Participants in the cannot-control mindset condition wrote about two aspects of their lives that they could not control and compared two examples.

Finally, participants reported their SWB (SWLS:  $\alpha=.90$ ; PA:  $\alpha=.89$ ; NA:  $\alpha=.89$ ), optimism ( $\alpha=.82$ ), authenticity ( $\alpha=.80$ ) again on day 13.

**Seven-month follow-up.** Seven months following baseline measurements, we contacted all the participants via email and asked them to complete an online survey regarding their physical and mental health. To assess participants' health, we used the Center for Disease Control's *Healthy Days Measures* (HD; Center for Disease Control and Prevention, 2000). This instrument is part of the CDC's Health Related Quality of Life measurements (HRQOL), which are used for tracking health status and quality of life in communities. From the HRQOL, we chose eight questions focusing on physical, mental, and energy-specific questions. Questions assessed how many days per month a respondent's physical health was not good since the study (HD-physical), how many days per month a respondent's mental health was not good since the study (HD-mental), and how many days per month a respondent has felt healthy and full of energy since the study (HD-energy, reversed coding). We transformed raw scores to z-scores to standardize the open-ended questions and combined them to form one scale ( $\alpha = .77$ ).

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## Results and Discussion

**SWB.** To assess changes in SWB from pre-intervention to post-intervention, we conducted a 2(mindset: can-control vs. cannot-control) X 2(time: pre-intervention vs. post-

intervention) mixed-model ANOVA. The predicted interaction was significant,  $F(1, 69)=12.23$ ,  $p = .001$ ,  $\eta^2 = .15$  (see Table 1 for all means in Experiment 1). The can-control-mindset condition was associated with increased SWB from pre-intervention to post-intervention,  $t(35)=3.04$ ,  $p=.004$ ,  $d=1.03$ . In contrast, the cannot-control mindset condition was associated with decreased happiness from pre-intervention to post-intervention,  $t(34)=-2.11$ ,  $p=.04$ ,  $d=-.72$  (see changes illustrated in Figure 2). Similarly, participants in the can-control-mindset condition had higher SWB than those in the cannot-control mindset condition, after controlling for participants' initial SWB,  $F(1, 68)=12.72$ ,  $p = .001$ ,  $\eta^2 = .16$ .

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**Optimism.** There was a change in optimism from pre-intervention to post-intervention,  $F(1, 69)=11.68$ ,  $p=.001$ ,  $\eta^2 = .15$ . The can-control-mindset condition *increased* optimism from pre- to post-intervention,  $t(35)=-2.82$ ,  $p=.008$ ,  $d=-.95$ , whereas the cannot-control-mindset condition *decreased* optimism,  $t(34)= 2.01$ ,  $p=.05$ ,  $d=.69$ . Participants in the can-control-mindset condition had higher optimism than those in the cannot-control-mindset condition, after controlling for participants' initial optimism,  $F(1, 68)=16.51$ ,  $p < .001$ ,  $\eta^2 = .20$ .

**Authenticity.** The control mindset intervention did not influence participants' authenticity after controlling for participants' initial authenticity,  $F(1, 68)=.12$ ,  $p=.73$ .

**7-month Mental and Physical Health follow-up.** Participants in the can-control mindset reported having a fewer number of days in which their physical and mental health were not good, compared to those in the cannot-control mindset,  $t(34) = -2.58$ ,  $p = .01$ ,  $d = -.88$ .

**Mediation Analyses.** We examined whether optimism or authenticity mediated the link between the control and SWB. A bias corrected bootstrap model with 5,000 samples found that optimism mediated the effect of the can-control mindset on SWB (95% CI: .21, .93), but authenticity did not mediate the effect (95% CI: -.17, .30). Similarly, using a bias corrected bootstrap model with 5,000 samples, we found that optimism mediated the effect of a can-control mindset on health as measured by the CDC healthy days measure at the 7-month follow-up (95% CI: -.60, -.06).

Experiment 1 provided initial support for our prediction that adopting a can-control mindset improved subjective well-being over time. In addition, the results of Experiment 1 demonstrated that the effect of a can-control mindset was evoked through changes in optimism and not changes in authenticity. Furthermore, the results of Experiment 1 demonstrated that the effects of a can-control mindset were not limited to SWB but also extended to psychological and physiological health, as measured by the Center for Disease Control's Healthy Days measure. The effects of physiological health were even found 7 months after the intervention, suggesting that the can-control intervention can have a particularly long lasting effect.

### **Experiment 2: Longitudinal Effects on Sales Performance**

The results of Experiment 1 showed that a can-control intervention provoked positive changes SWB and that these changes were likely to be driven through changes in optimism. Experiment 2 was designed to extend Experiment 1 in two important ways: dealing with an alternative explanation and broadening our outcome measures to employee performance.

One alternative explanation for the results of Experiment 1 is that the can-control mindset interventions is simply increasing positive mood. While evoking positive changes in health and well-being through increasing positive mood would be an important and interesting finding on its

own, our theoretical model suggests that the perception of control leads to optimism about the future, which, in-turn produces positive changes in SWB and health. This means that a can-control mindset is not simply a positive mood induction but rather a tool to increase perceived control and therefore long-term optimism. To tease this important theoretical distinction apart, we designed Experiment 2 to include three conditions: can-control, cannot-control, and positive mood (participants in the positive mood condition were instructed to think about positive events that made them happy).

Experiment 2 was also designed to test whether the effects would affect consequential behavior in organizations. Furthermore, given the well-established link between perceived control, optimism, and performance (Avey, Reichard, Luthans, & Mhatre, 2011; Brockner et al., 2004), we tested whether a can-control mindset intervention would improve work performance by increasing optimism.

Finally, Experiment 2 eliminated self-report biases by collecting changes in sales metrics as an objective index of performance. We predicted that participants in the can-control condition would report more SWB and perform better (have higher sales) compared to those in the cannot-control and the positive mood conditions.

### **Participants**

Seventy-six sales employees in one of the largest US bedding retailers (41.6% male,  $M_{\text{age}}=36.7$  years,  $SD=4.8$ ) were recruited to participate in a study on “well-being at work” and randomly assigned to one of three conditions: 1) can-control mindset, 2) cannot-control mindset, and 3) positive mood. 10 employees who failed to complete at least three of the six interventions over the course of the study were removed from analyses. 6 employees who did not follow the

manipulation instructions were also removed<sup>1</sup>. A total of 60 employees completed the post-intervention assessment on day 13.

### **Procedure**

The study timeline is presented in Figure 3. We used the same 13-day, randomized controlled intervention as in Experiment 1 to explore the longitudinal effects of a can-control mindset on employees' happiness and work performance in a real work-setting. As in Experiment 1, we first asked employees to complete a pre-questionnaire for the baseline assessment; they completed measures of SWB (SWLS:  $\alpha=.90$ ; PA:  $\alpha=.90$ ; NA:  $\alpha=.86$ ), optimism ( $\alpha = .66$ ), and authenticity ( $\alpha = .69$ ).

Next, participants in the *can-control mindset condition* were asked to identify two things that they could control in their life and to compare these two examples. Participants in the *cannot-control mindset condition* were asked to identify two things that they could not control and to compare them. Participants in the *positive mood condition* were asked to identify two things that make them happy and to compare them.

As in Experiment 1, we had participants complete the manipulation every other day (e.g., days 2, 4, 6, 8, 10, and 12). After the longitudinal intervention, we asked employees to complete a post-questionnaire that consisted of the same measures as in the baseline assessment SWB (SWLS:  $\alpha=.94$ ; PA:  $\alpha=.93$ ; NA:  $\alpha=.89$ ), optimism ( $\alpha = .69$ ), and authenticity ( $\alpha = .68$ ). Finally, we collected each employee's sales performance data for two weeks before the intervention and for two weeks after the intervention to examine the effect of the control-mindset intervention on work performance.

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<sup>1</sup> Two participants who were assigned to cannot-control-mindset condition wrote about things they could control. One participant who was assigned to can-control-mindset condition wrote about things he or she did not do well. The remainder of excluded participants did not write anything in the manipulation stage.

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Insert Figure 3 about here

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## Measures

To replicate the effects of Experiment 1, we included the same SWB, optimism, and authenticity measures that we assessed in Experiment 1. In addition, we included measures to investigate how a can-control mindset affects employees' performance at work.

**Work performance.** We assessed each employee's sales data by examining two weeks' sales he or she achieved before and after the intervention. We used the log transformation because the test of normality (Shapiro-Wilk Test) showed that the data was positively skewed,  $w(60) = .96, p = .04$ .

## Results and Discussion

**Changes in Work Performance.** To assess changes in sales performance from pre-intervention to post-intervention, we conducted a 3(mindset: can-control vs. cannot-control, vs. positive mood) X 2(time: pre-intervention vs. post-intervention) mixed-model ANOVA. The predicted interaction was significant,  $F(2, 57)=4.00, p=.02, \eta^2= .12$  (see Table 2 for all means in Experiment 2). The can-control-mindset condition was associated with increased sales performance from pre-intervention to post-intervention  $t(21)= 2.80, p=.01, d= 1.22$ . In contrast, the cannot-control mindset condition was associated with decreased sales performance from pre-intervention to post-intervention,  $t(18)=-2.07, p=.05, d= 0.98$ . However, in the positive mood condition, there was no difference in sales performance between pre-intervention and post-intervention,  $t(18)=-.18, p= .86$  (see changes illustrated in Figure 4). Participants in the can-control-mindset condition had higher sales performance than those in the cannot-control mindset condition,  $F(1, 39)=8.32, p =.006, \eta^2= .18$  and those in the positive mood condition,  $F(1, 39)= 2.06, p=.16, \eta^2= .05$ .

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**Changes in SWB.** To assess changes in SWB from pre-intervention to post-intervention, we conducted a 3(mindset: can-control vs. cannot-control, vs. positive mood) X 2(time: pre-intervention vs. post-intervention) mixed-model ANOVA. The predicted interaction was significant,  $F(2, 57)=6.65, p=.003, \eta^2 = .19$ . The can-control-mindset condition was associated with increased SWB from pre-intervention to post-intervention,  $t(21)= 2.79, p=.01, d= 1.22$ . In contrast, the cannot-control mindset condition was associated with decreased happiness from pre-intervention to post-intervention,  $t(18)= -2.47, p=.02, d= -1.16$ . In the positive mood condition, there was no difference in SWB between pre-intervention and post-intervention,  $t(18)= .22, p=.83$ . At follow-up, participants in the can-control-mindset condition had significantly higher SWB than those in the cannot-control-mindset condition,  $F(1, 39)=13.92, p=.001, \eta^2 = .26$  and those in the positive mood condition,  $F(1, 39)=3.98, p=.05, \eta^2 = .09$ .

**Changes in Optimism.** To assess changes in optimism from pre-intervention to post-intervention, we conducted a 3(mindset: can-control vs. cannot-control, vs. positive mood) X 2(time: pre-intervention vs. post-intervention) mixed-model ANOVA. The predicted interaction was significant,  $F(2, 57)= 3.37, p=.04, \eta^2 = .11$ . The can-control-mindset condition was associated with increased optimism from pre-intervention to post-intervention,  $t(21)= -2.37, p=.03, d=.69$ . In contrast, the cannot-control mindset condition was associated with decreased optimism from pre-intervention to post-intervention, although it was not significant,  $t(18)=1.34, p=.19, d=.42$ . There was no difference in optimism for the positive mood condition between pre-

intervention and post-intervention,  $t(18) = -.88, p = .39$ . At follow-up, participants in the can-control-mindset condition had significantly higher optimism than those in the cannot-control-mindset condition,  $F(1, 39) = 5.15, p = .03, \eta^2 = .12$  and those in the positive mood condition,  $F(1, 39) = .80, p = .38, \eta^2 = .02$ .

**Authenticity.** Consistent with Experiment 1, the control mindset intervention did not influence participants' authenticity after controlling for participants' initial authenticity,  $F(1, 56) = .11, p = .90$ .

**Mediation Analyses.** A bias corrected bootstrap model with 5,000 samples found that optimism mediated the effect of a can-control mindset on work performance as measured by sales data (95% CI: -.31, -.02), but authenticity did not mediate the effect (95% CI: -.04, .03). Consistent with Experiment 1, a bias corrected bootstrap model with 5,000 samples found that optimism mediated the effect of the can-control mindset on SWB (95% CI: -.85, -.06), but authenticity did not mediate the effect (95% CI: -.12, .10).

Taken together, the results of Experiment 2 replicate the results from Experiment 1 in demonstrating that a can-control mindset evokes changes in optimism, which, in-turn evokes changes in SWB. In addition, the results from Experiment 2 extend the results of Experiment 1 by demonstrating that these effects are distinct from a positive mood induction. Moreover, Experiment 2 demonstrates that the effects of a can-control mindset are not limited to SWB and health but also to objective work performance, as indicated by significant changes in sales performance initiated by the control mindset intervention.

### General Discussion

Across two experiments, we found consistent effects of control mindsets on important outcomes related to well-being, health, and organizational performance. A can-control mindset

increased SWB, physical health, and sales performance, whereas a can-control mindset *decreased* these outcomes. In addition, we found a consistent driver of this process, the improvement in these outcomes was mediated by changes in optimism: increased optimism led to higher SWB (Experiments 1-2), greater health (Experiment 1), and improved objective work performance (Experiment 2). In sum, the results support our initial model that a can-control-mindset leads to optimism which then produces SWB, physical health, and work performance (see Figure 5).

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Insert Figure 5 about here

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The experiments also establish the discriminant validity of the mechanism. Even though authenticity is strongly linked with SWB and health, the effects of the control mindsets operated through changes in optimism and not through changes in authenticity. We also demonstrated the discriminant validity of the intervention – the effects of the can-control mindset intervention were greater than, and distinct from, a positive mood intervention.

### **Contributions**

The current experiments make several important contributions. First, we advance the literature on the benefits of perceived control by establishing that a subtle change in one's mindset—focusing on what one can control vs. what one cannot control—can meaningfully alter important outcomes without changes in objective reality or behavior. A primary strength of our intervention is that it is focused on what one *really* can control, without having to manipulate objective levels of control or to create illusory control. In other words, the can-control mindset intervention employed in these three experiments did not require participants to seek out more control in their lives or to pretend that they had control when they did not. Instead, our can-

control mindset intervention is built on the premise that perceived control is largely a matter of creating a particular mindset through selective focus. These results fall in line with the effects of mindset demonstrated in other domains such as intelligence (Dweck, 2008), empathy (Schumann et al., 2014), will-power (Job, Dweck & Walton, 2010), and stress (Crum et al., 2013). Our results demonstrate that simple changes in a mindset related to control can produce meaningful and lasting differences in well-being, health, and performance.

Second, our findings capture the underlying mechanism that drives the effect of a can-control mindset on SWB. We consistently found that optimism mediates the link between a can-control mindset and SWB. In contrast, authenticity, which is a key ingredient in SWB, does not mediate this link. This is a key finding as it establishes discriminant validity for our optimism mediator. Although past research has suggested a link between perceived control and SWB, the underlying processes of the effect have not been empirically examined until now.

Third, the research adds to the positive psychology literature dedicated to finding ways to improve well-being. Psychology has long focused on the causes and treatments of psychological illness, yet it has only recently tried to capture what makes us happy (Seligman, Walker, & Rosenhan, 2001; Lyubomirsky et al., 2011). Our study adds a simple, feasible, but powerful intervention that can help people efficiently improve well-being. It demonstrates that a can-control mindset can improve people's well-being over time. Until recently, many psychologists have believed in a set-point theory of happiness that suggests people's happiness level is fairly constant and difficult to change (e.g., Eid & Diener, 2004). Yet, consistent with our findings, recent work shows that practices such as expressing gratitude and visualizing "best possible selves" can improve well-being (Lyubomirsky et al., 2011). The current research adds to this

repertoire by providing a simple and feasible intervention that can help people improve their well-being over time, by reorienting their mindset to focus on what they can control.

### **Limitations and Future Directions**

Although the results herein are intriguing, several questions remain unanswered. The two experiments employed a 13-day intervention based on previous work done by Lubermersky and colleagues (2005). Other studies on mindset interventions have used shorter timelines, suggesting that the 2-week timeframe for this intervention may not be necessary. It is also not clear whether the intervention task, adopting a control mindset, was only completed during the prompted times or whether this intervention may have led participants to revisit the task on their own time. Future research would benefit from daily diaries or other methods to capture how participants are orienting their mindsets around control each day.

Second, although we employed an objective measure of work performance in Experiment 2, measures of SWB, optimism, and health were collected via self-report. Future research employing physiological measures as well as observer reports would help to overcome these limitations.

Finally, even though the positive effects on SWB, health, and performance are encouraging, one might also wonder about inadvertent negative effects of focusing only on what one can control. For example, a can-control mindset might lead people to make unwise investments or to escalate one's commitment to a losing course of action (i.e., Staw, 1991). Although this possibility has not been tested in the domain of control mindset, future research should explore when a can-control mindset can turn negative.

### **Conclusion**

In a world burdened by randomness and uncertainty, it may be sobering to face the fact that true control can be elusive. Recall the young American foreign-service officer, John Limbert, held hostage in the American Embassy in Tehran for 444 days; despite a harsh and seemingly unending captivity, he created a can-control mindset by focusing on aspects of the prison that were *his* space and *his* territory, governed under his dominion. The current research confirms his intuition regarding a sense of control and establishes clear support for the psychological benefits of reflecting on what we can control. Even in the harshest circumstances, we can create motivation and optimism, not necessarily by changing our situation, but simply by changing our mindset.

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Figure 1. Experiment 1 Timeline

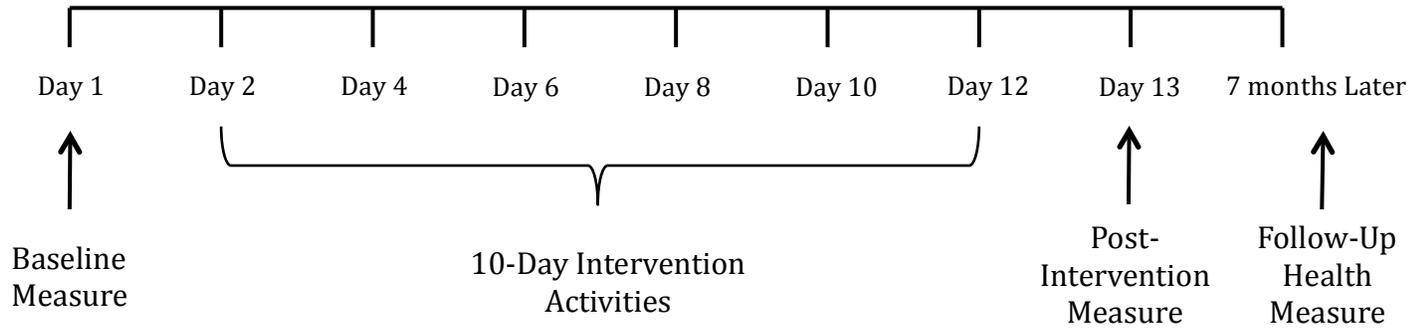


Figure 2. Changes in SWB as a Function of Control Mindset Condition in Experiment 1

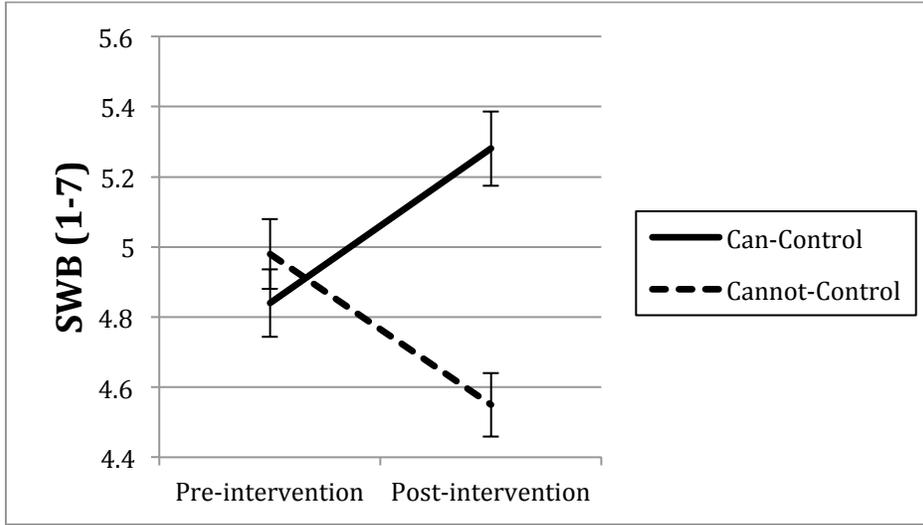


Figure 3: Experiment 2 Timeline

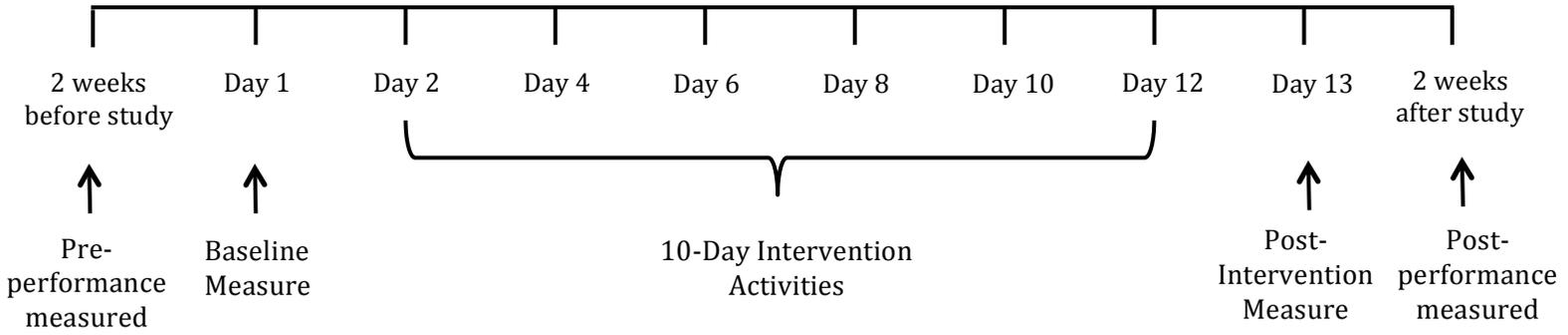


Figure 4. Changes in Sales Performance as a Function of Condition in Experiment 2

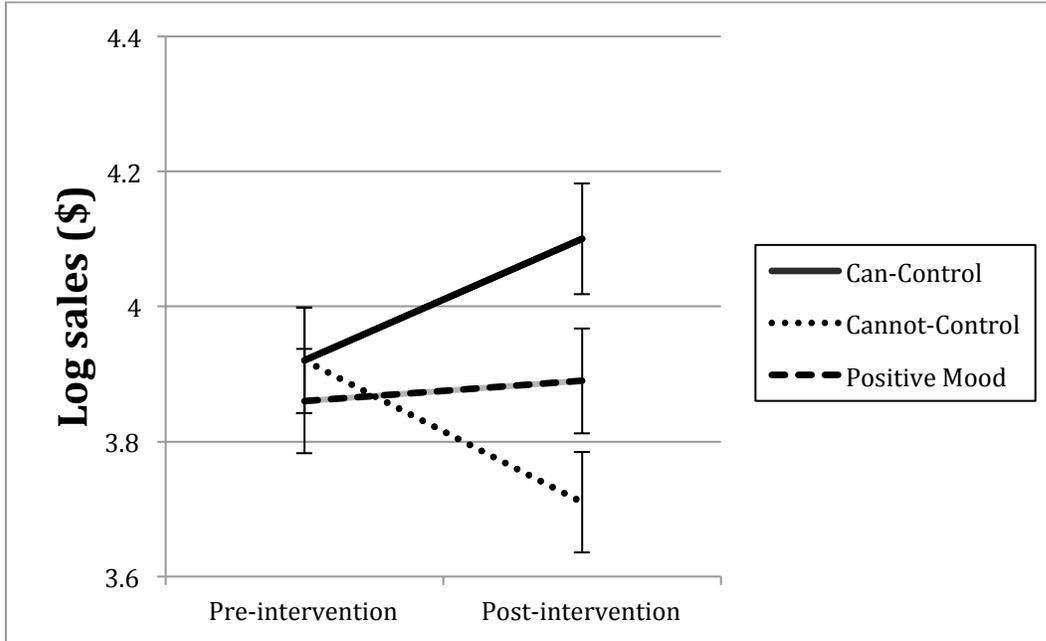


Figure 5. Model of the Impact of Control Mindset on SWB, Health, and Work Performance

Performance

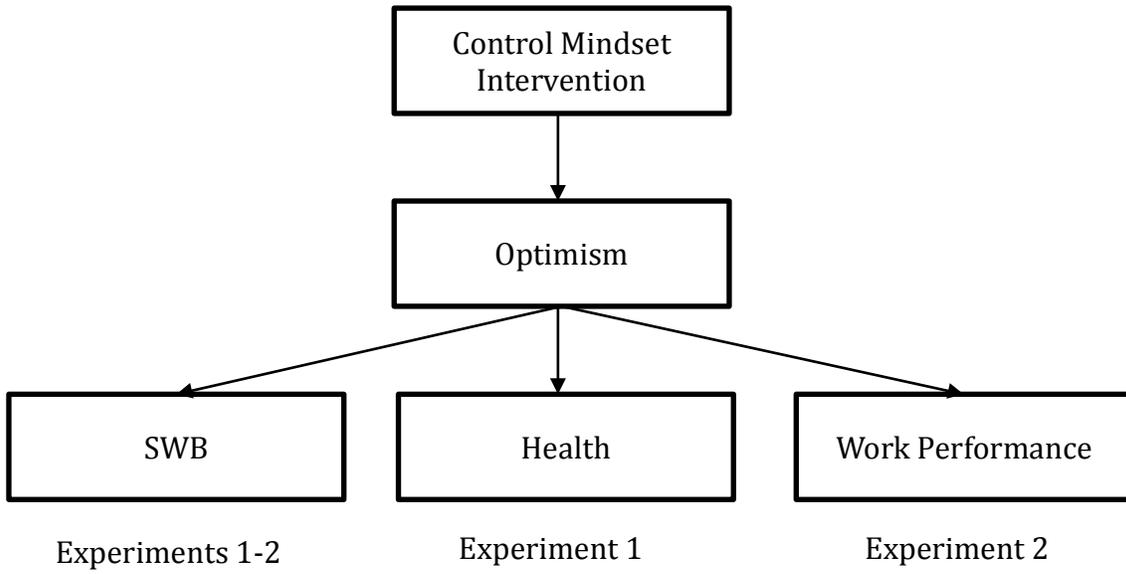


Table 1. Mean Subjective Well-Being (SWB), Optimism, and Authenticity ratings in Experiment 1. Standard deviations are in parentheses. Means within columns that have different subscripts are significantly different from each other ( $p < .05$ ).

	Experiment 1						
	SWB		Optimism		Authenticity		Mental and Physical Health
	Pre	Post	Pre	Post	Pre	Post	
Can Control	4.84 <sub>a</sub> (0.58)	5.28 <sub>a</sub> (0.77)	4.30 <sub>a</sub> (0.85)	4.91 <sub>a</sub> (0.70)	4.78 <sub>a</sub> (0.79)	4.81 <sub>a</sub> (0.54)	-0.25 <sub>a</sub> (0.55)
Cannot Control	4.98 <sub>a</sub> (0.81)	4.55 <sub>b</sub> (1.01)	4.49 <sub>a</sub> (0.86)	4.06 <sub>b</sub> (0.98)	4.62 <sub>a</sub> (0.64)	4.75 <sub>a</sub> (0.47)	0.28 <sub>b</sub> (0.70)

Table 2. Mean Subjective Well-Being (SWB), Optimism, and Work Performance ratings in Experiment 2. Standard deviations are in parentheses. Means within columns that have different subscripts are significantly different from each other ( $p < .05$ ).

	Experiment 2					
	SWB		Optimism		Work Performance	
	Pre	Post	Pre	Post	Pre	Post
Can Control	5.08 <sub>a</sub> (0.73)	5.62 <sub>a</sub> (0.65)	4.35 <sub>a</sub> (0.56)	4.98 <sub>a</sub> (1.17)	3.91 <sub>a</sub> (0.26)	4.05 <sub>a</sub> (0.25)
Cannot Control	5.18 <sub>a</sub> (0.75)	4.73 <sub>b</sub> (0.87)	4.51 <sub>a</sub> (0.62)	4.01 <sub>b</sub> (1.58)	3.94 <sub>a</sub> (0.31)	3.74 <sub>b</sub> (0.43)
Positive Mood	5.19 <sub>a</sub> (0.86)	5.24 <sub>c</sub> (0.56)	4.34 <sub>a</sub> (0.83)	4.61 <sub>ab</sub> (1.49)	3.91 <sub>a</sub> (0.26)	3.89 <sub>ab</sub> (0.44)