Cultivating Optimism: How to Frame Your Future during a Health Challenge

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Research shows that optimism can positively impact health, but when and why people feel optimistic when confronting health challenges is less clear. Findings from six studies show that the frames people adopt when thinking about health challenges influence their optimism about overcoming those challenges, and that their culture moderates this effect. In cultures where the independent self is highly accessible, individuals adopting an initiator frame (how will I act, regardless of the situations I encounter?) were more optimistic than those adopting a responder frame (how will I react to the situations I encounter?); the converse occurred for individuals from cultures where the interdependent self is highly accessible. Moreover, mediation and moderation evidence revealed that this interactive effect of culture and frame on optimism was driven by people's ability to easily imagine the recovery process. These effects held for distinct health challenges (cancer, diabetes, flood-related illness, traumatic injury) and across single-country and cross-country samples, and they impacted positive health outcomes and decisions ranging from anticipated energy, physical endurance, and willingness to take on more challenging physical therapy to intentions to get vaccinated, stick to a doctor-recommended diet, and undertake a physically strenuous vacation.

Keywords: optimism, health, culture, mental simulation, framing

At some point during their lives, most people will face a traumatic health event, and mounting evidence suggests that psychological factors are vital to recovery (Taylor and Broffman 2011). One such critical factor is optimism, defined as a generalized belief that good outcomes

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are possible (Scheier and Carver 1985). Optimism improves mental and physical well-being, augmenting one's ability to cope with stress and recover from surgery, fostering better health habits, reducing physical symptoms of illness, and even extending lives (Carver, Scheier, and Segerstrom 2010; Scheier and Carver 1985; Taylor et al. 1992). Yet, despite the clear benefits, little is known about when and how people cultivate optimism when confronted with a health challenge. These questions are particularly important in the context of consumer behavior, where researchers have increasingly sought to identify ways to encourage people to adopt actions or treatments to improve physical health (e.g., vaccines, diets, or physical therapy regimens; Agrawal, Menon, and Aaker 2007; Bublitz, Peracchio, and Block 2010; Keller and Lehman 2008).

In our research, we show that the mental frame people adopt when considering how to cope with a health challenge significantly impacts their optimism about recovery, and that culture moderates this effect. Across six studies we predicted and found that, when facing a health challenge, people with an independent cultural background

who adopt an initiator frame (how will I act, regardless of the situations I encounter?) versus responder frame (how will I react to the situations I encounter?) are more optimistic about their recovery, and that the converse is true for people with an interdependent cultural background. Further, these effects on optimism are driven by the extent to which individuals can easily imagine their recovery process. We also show that this greater optimism is reflected in people's health-related decisions and leads to beneficial health outcomes, including greater anticipated energy and physical endurance; stronger preferences for more intensive physical therapy and physically strenuous leisure; and increased intentions to use doctor-recommended treatments.

Through this research, we hope to contribute theoretically to a number of literatures, including consumer behavior, mental imagery, and framing. For instance, although prior research has found that imagining the processes involved in reaching a goal can facilitate goal attainment (Hayes-Roth and Hayes-Roth 1979; Taylor et al. 1998), various styles of process-oriented imagining have been studied in the literature. Our work contributes to this literature by exploring when and why it is more beneficial to adopt one of these imagining styles over another. In particular, we examined the effectiveness of two such styles—one in which imagery in the mind is understood through a person-focused, initiator frame, and another in which it is understood through a situation-focused, responder frame.

The present research also contributes to extant literature by showing that when an individual uses mental imagery to find solutions to a health challenge, effective cultivation of optimism depends not only on how that person frames images (initiating actions vs. responding to situations), but also on whether this framing is consistent with the person's culturally influenced self-view (i.e., independent vs. interdependent). In particular, we show that when there is alignment between one's cultural background and the frame adopted, optimism about recovering increases because it is easier to imagine oneself taking necessary steps to get better (Jiang et al. 2014; Petrova and Cialdini 2005). Although prior research has shown that matching effects can have many consequences (Avnet and Higgins 2003, 2006; Cesario, Grant, and Higgins 2004; Lee and Aaker 2004), the present research extends this literature by identifying both a novel positive outcome of frame alignment (greater optimism) and a novel mechanism (ease of imagining one's recovery).

Last, the present research answers mounting calls for studies that increase the range of consumption-related behaviors examined, contribute to conversations that stretch across disciplines (Dahl et al. 2014), and fundamentally improve consumers' well-being (Goldberg 2008; Mick et al. 2012). Indeed, from an applied perspective, our work offers insights to help consumers recover after they experience a serious health challenge (e.g., recovering from surgery, battling cancer) and help practitioners to positively impact consumers' health-related decisions.

THEORETICAL BACKGROUND

Mental Simulation and Framing

The path to health recovery is often complicated by uncertainty and unpredictable circumstances, which can hamper good decisions (Haidt and Rodin 1999). However, these obstacles can be better managed when people imagine themselves taking steps to overcome their health challenge, which entails generating picture-like mental representations (Jiang et al. 2014; Kosslyn 1976). This particular type of imagery generation, which emphasizes simulating the process needed for reaching a goal, is referred to as process-oriented mental simulation or process-oriented imagining (Taylor et al. 1998). Though other forms of mental simulation (e.g., fantasizing success, painful ruminations, outcome-focused simulating) are often unhelpful or even maladaptive (Horowitz 1976; Kappes, Sharma, and Oettingen 2013; Oettingen 1996; Silver, Boon, and Stones 1983; Taylor et al. 1998), process-oriented imagining has been shown to be beneficial for goal attainment (Hayes-Roth and Hayes-Roth 1979; Markus and Ruvolo 1989; Taylor et al. 1998). This is because imagining the process needed to reach a desired end state offers a view of a hypothetical reality that transcends the here and now—providing a platform for envisioning possibilities, anticipating emotional states, building motivation, exploring one's own potential, and ultimately, planning for the future effectively (Markus and Nurius 1986; Oyserman and Markus 1990; Pham and Taylor 1999; Ruvolo and Markus 1992; Taylor et al. 1998).

Extant literature, however, also suggests that there are different styles of process-oriented imagining that people might adopt when envisioning the future (e.g., when imagining the process of recovering from a health challenge). First, some research suggests that people might benefit from accepting and embracing the uncontrollable, ever-changing nature of long-term health recovery by developing situation-focused, if-then contingency plans (Hayes-Roth and Hayes-Roth 1979; Taylor et al. 1998). Another perspective, though, is that those on the road to recovery should focus internally, emphasizing their own abilities and strengths when planning, thereby bolstering self-confidence (Niemiec, Ryan, and Deci 2010). Thus, prior research has variously touted styles of process-oriented imagining that fit both the former, situation-focused approach and the latter, person-focused approach for imagining one's future (Markus and Ruvolo 1989; Taylor et al. 1998). However, what remains unclear is when and why it might be more beneficial to adopt one of these imagining styles over the other when facing a health challenge.

To address this question, we suggest that these two generalized approaches can be understood as different frames that one might adopt when imagining the future: the "initiator" frame (how will I act, regardless of the situations I encounter?) and the "responder" frame (how will I react to the situations I encounter?). These two proposed frames are in essence knowledge structures stored in memory that guide image generation, and are subject to the same rules as other cognitive procedures (e.g., they can be activated by external prompts). But notably, whereas most cognitive procedures directly guide behaviors, the frames we propose guide the depiction of behaviors one imagines when thinking about how to reach a goal, such as recovering from a health challenge. Thus, once activated, a frame can influence which representations drive one's imaginings and how emerging images are interpreted.

Consistent with the aforementioned situation-focused approach, a person might in some cases adopt a responder frame when imagining her or his recovery process. When this is the case, the images and scenes called to mind are likely to center on future situations that may be encountered. One's actions are seen as embedded within their surrounding context, sensitive to the flow of external influences. Alternatively, consistent with the person-focused approach, a person might adopt an initiator frame when imagining her or his recovery process. In this case, the resulting images and scenes are likely to highlight the individual rather than particular situations she or he might face. The individual is often depicted more abstractly, without detailing the surrounding context or particular situations, narrowly focusing on efforts necessary for addressing the health challenge. At a deeper level, the initiator-responder distinction can be characterized by the nature of the representations that are likely to predominate when imagery is generated. In particular, responder versus initiator frames might be more likely to call up event (situation-related) rather than entity (person-related) representations, or to call up situation-related representations that are less broad or generalizable (Wyer 2004).

Though parallels can be drawn between the initiator-responder frame constructs and some extant consumption-relevant dichotomies that also distinguish between being more or less situation-focused, key differences separate our constructs from these other dichotomies. First, other dichotomies differ from ours in that they often pertain only to a particular domain of activity (e.g., shopping; Massara, Liu, and Melara 2010). Second, whereas these other dichotomies are limited to describing the extent to which situational context draws attention and influences judgments and behaviors, the frames we propose characterize imagined (rather than actual) behaviors and activities, and thus operate in the domain of mental imagery, where the creations of people's minds are at work. Exploring the influence of frames for imagining is important because the rules governing real-world behavior do not necessarily apply to the imagined world (Markus and Nurius 1986).

Third, the defining principles underlying the frame dichotomy we propose also differ from the traditional context-dependence dimension. In particular, context dependence (vs. independence) is characterized by a greater tendency to be content rather than struggle with encountered situations, to acquiesce or bend to the environment, and to align oneself with group needs (Ji, Peng, and Nisbett 2000; Kuhnen, Hannover, and Schubert 2001; Singelis et al. 1995; Weisz, Rothbaum, and Blackburn 1984). However, unlike the context-dependence construct, the initiator-responder distinction does not describe the extent to which one is in harmony with, or subordinates control to, her or his environment. This distinction instead identifies one's orientation (situation-focused, person-focused) when imagining the process needed to reach a target end goal such as health recovery—not the intensity with which one actively pursues this end goal.

Along these lines, it is also important to note that initiator and responder frames can be used to envision the same behavior or activity. For instance, when faced with a serious injury and imagining the process for recovering, an individual might see herself as a responder and, therefore, generate images that depict various situations she will face during recovery and how to address them. With this perspective, she might anticipate particular difficult situations (sleepless nights due to pain) and form a plan for addressing these occasions (physical therapy). Alternatively, she could see herself as an initiator and imagine the future with less sensitivity to the specific situations that might emerge. She might develop general person-focused solutions to pursue in this case, such as committing to spend more time doing physical therapy. As this anecdote illustrates, the same physical therapy solution can arise via the initiator or responder imagining process, though the resulting mental imagery either ties the activity to the situation (responder) or individual (initiator).

Culture and Consumer Choice

Consumers' cultural backgrounds, we suggest, affect which of these frames is most effective for cultivating optimism when one imagines one's health recovery. In the last three decades, researchers have conceptualized culture in terms of the view of the self: Over time, as people grasp and internalize the prevailing norms and values of the society in which they live, they tend to develop either a chronically accessible interdependent or independent self-view. Westerners typically adopt an independent view of the self, and East Asians typically adopt an interdependent view (Markus and Kitayama 1991). This distinction has implications for how people make sense of the social world as well as their basic cognitive processes (Briley, Wyer, and Li 2014; Mourey, Oyserman, and Yoon 2013).

People with highly accessible independent selves define themselves by their distinct attributes, qualities, and characteristics, and gaining this important knowledge requires drawing generalizations across situational contexts. For example, a student might be described as hardworking because he puts a great deal of effort into his classes, job, and sports activities. Thus, in the process of developing an independent self-view, one becomes accustomed to centering one's thinking on the individual and organizing knowledge structures accordingly. On the other hand, those with interdependent selves define people based on important relationships and connections to others. Because the acquisition of this knowledge depends on attending to social context and adjusting to its changes (Kuhnen et al. 2001), people with a dominant interdependent (vs. independent) self-view tend to see people and the surroundings they encounter as intertwined and inseparable, adopting a more holistic view that integrates person and situation (Masuda et al. 2008; Monga and John 2007).

Our contention is that imagery-generation processes can be influenced by one's self-view. As a starting point, prior research has shown that the accessibility of situation-specific information in memory differs depending on self-view. For instance, when describing themselves in the Twenty Statements Test (Cousins 1989), Japanese individuals use more situation-qualified descriptors (e.g., I work hard at tennis), whereas Americans use more situation-irrelevant descriptors (e.g., I am hardworking). Morris and Peng (1994) provided further evidence of this assertion by analyzing news reports of mass murders. They compared articles about two assailants—Gang Lu (a Chinese physics student) and Thomas McIlvane (an American postal worker)—that appeared in the leading English-language (*New York Times*) and Chinese-language (*World Journal*) newspapers. These newspapers were targeted at American and Chinese communities, respectively. In the articles, Chinese reporters most often suggested that situational forces impinging on the assailant caused the tragedy (e.g., a recent firing, or isolation from loved ones), whereas American reporters most often attributed the events to characteristics internal to the assailant (e.g., a bad temper or mental instability).

Further evidence of this pattern has emerged in examinations of cognitions guiding judgments rather than decisions or behaviors. In a study by Masuda et al. (2008), American and Japanese participants assessed the happiness of a person who appears in a photo with other people in the background. The Americans relied on the facial expression of the focal person to determine his happiness, whereas the Japanese spent relatively more time focusing on the facial expressions of the people in the background and drew on these contextual factors when assessing the focal person's happiness. This research shows that for the interdependent self, behaviors are understood to be intertwined with and to emerge from the context in which they occur. For the independent self, the context is less important.

In our research, we seek to forge a connection between this work and the literature on matching and fit effects. In particular, we posit that when people are facing a health challenge, optimism should be most effectively cultivated under conditions that activate a frame that is more aligned with their culture's normative viewpoint. Prior research has shown that alignment between the task at hand and a person's goal orientation can influence many judgment and decision-making outcomes (Avnet and Higgins 2006; Cesario et al. 2004; Lee and Aaker 2004). The present research aims to extend this literature by exploring a different type of alignment—that between one's cultural background and the type of mental simulation frame one adopts—and identifying its effect on optimism, an outcome that has yet to be examined in the extant matching and fit literature. In particular, we posit that, to generate greater optimism when imagining how to address a health challenge, people with an independent self-view should adopt an initiator frame, which elicits imagery focusing on the individual and his or her actions rather than the situations in which these actions occur. Those with an interdependent self-view, on the other hand, should embrace a responder frame, which elicits imagery focusing on situations one might encounter and appropriate responses.

We also posit that having such alignment increases optimism by facilitating one's ability to imagine undertaking the steps needed to overcome the health challenge. When alignment occurs between the mental simulation frame that a person adopts and her or his predominant self-view, the future activities he or she imagines should be depicted more readily and in a more familiar way. Indeed, research has shown that people have a harder time comprehending relevant task information when they approach the task with a perspective that differs from that which they are dispositionally inclined to use (Lee and Labroo 2004; Wyer, Hung, and Jiang 2008; Wyer and Xu 2010). And if it is easier for the person to imagine the process of recovering, the recovery plan should seem more definite and feasible, and the attainment of the desired health outcome should be perceived as more likely to actually occur (Mandel, Petrova, and Cialdini 2006; Sherman et al. 1985). Consequently, optimism about recovering should increase.

Notably, the mechanism we propose departs from prior research, in that past work has generally pointed to a person's feelings of fit (processing fluency) as the driver of matching-related effects. Fit creates a feeling of being right about reactions to stimuli, increasing the importance of and engagement in these reactions, whether positive or negative (Avnet and Higgins 2006). However, feelings of fit cannot adequately account for our predicted optimism effects in the health recovery domain. When facing a health challenge and imagining one's future experiences and behaviors, one is likely to have positive reactions to

imagined triumphs or progress, and negative reactions to imagined struggles, pains, or setbacks. Consequently, an account based on feelings of fit would predict that the importance or strength of all of these reactions—both positive and negative—would be equally enhanced and that, as a result, optimism could potentially increase, decrease, or be left unchanged, depending on the mix of positive and negative reactions. This differs from the ease-of-imagining account, which offers a straight prediction of greater optimism. Regardless of how difficult that recovery process is envisioned to be, when it is easier for people to imagine themselves undertaking the recovery process, they should believe that recovery is more likely to actually occur, boosting optimism.

Returning to our previous example, a woman who has suffered serious injuries might imagine doing physical therapy to get better (and this activity could be considered regardless of whether she adopts an initiator or responder frame). But importantly, we propose that the ease with which she can imagine herself engaging in and completing this imagined activity should be influenced by the combination of the frame she adopts (initiator or responder) and her cultural background. If she is Chinese and thus likely has an interdependent self-view, she should be able to more easily imagine these therapy sessions with a responder (vs. initiator) frame in place and, as a result, should become more optimistic about the recovery ahead. On the other hand, if she is European American and thus likely has an independent self-view, she should be able to more easily imagine these sessions with an initiator (vs. responder) frame in place and, as a result, should become more optimistic about the recovery ahead. In sum, we predict an interactive effect of culture (independent vs. interdependent) and frame (initiator vs. responder) on optimism, an effect that is mediated by the ease with which people can imagine carrying out activities planned for recovering from their health challenge.

> **H1a:** For participants facing a health challenge, their cultural background and frame will have an interactive effect on their optimism about recovering: (a) when participants with independent self-views imagine activities for recovering from a health challenge, they are more optimistic about recovering if they adopt an initiator (vs. responder) frame; (b) when participants with interdependent self-views imagine the process of recovering from a health challenge, they are more optimistic about recovering if they adopt a responder (vs. initiator) frame.
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> **H1b:** For participants facing a health challenge, the interactive effect of a participant's culture and frame on their optimism will be reflected in health-related decisions (willingness to take on more challenging physical therapy during recovery, preference for physically challenging leisure, and intent to use or follow recommended treatments).
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> **H2**: For participants facing a health challenge, the interactive effect of a participant's culture and frame on their

optimism is mediated by the ease with which they can imagine engaging in the activities they are planning for overcoming their health challenge.

OVERVIEW OF STUDIES

We present six studies to examine how cultural background and the frame participants adopt impact their optimism when confronting a health challenge. In study 1, Asian American and European American participants imagined they had been seriously injured in a car accident, had either a responder or initiator frame activated when thinking about what they would do to recover, and then told us what vacations and diet plans they would choose in the wake of this incident. In line with our predictions, participants made choices reflecting a more optimistic outlook when their cultural backgrounds and frame matched. Asian Americans who adopted a responder (vs. initiator) frame were more likely to choose the more physically demanding vacation plan and believed they could follow the diet for a longer time, whereas European Americans who adopted an initiator (vs. responder) frame were more likely to choose the more physically demanding vacation plan and believed they could follow the diet for a longer time.

In study 2, Asian American and European American cancer survivors adopted either a responder or initiator frame when thinking about how to address their illness, then reported how optimistic they were about overcoming their cancer and, for convergent validity, told us how much physical energy they anticipated feeling in the future. We expected these two measures to converge because a patient's outlook for recovering and perceptions of available energy for fueling this fight are related (Achat et al. 2000; Schröder, Schwarzer, and Konertz 1998) and are both positively associated with recovery, echoing the inextricable link between physiological and psychological states (Crum et al. 2011; Crum, Salovey, and Achor 2013; Taylor et al. 1992). As predicted, Asian American cancer survivors were more optimistic about recovering when they adopted a responder (vs. initiator) frame, whereas European American cancer survivors were more optimistic when they adopted an initiator (vs. responder) frame. Participants' anticipated physical energy showed a similar pattern.

Building on these findings, study 3 showed effects of initiator versus responder frames on people's physical endurance, directly establishing that the influence of these frames encompasses physiological outcomes. We asked Asian Americans and European Americans to imagine they were recently diagnosed with cancer. After being prompted to adopt either an initiator or responder frame, they considered how they could stay active while fighting the disease, and repeatedly squeezed a handgrip while developing a personal plan for exercising. We recorded the force they

applied to the handgrip and used this as a behavioral measure of physical endurance. The results replicated the pattern found in study 2: Asian Americans exhibited greater physical endurance when adopting a responder (vs. initiator) frame, and European Americans exhibited greater physical endurance when adopting an initiator (vs. responder) frame.

Having established the interactive effect of culture and frame on optimism, in the remaining studies (studies 4–6) we focused on testing the mechanism underlying it. Study 4 showed that the ease with which participants could imagine their coping activities after a serious injury mediates the influence that culture and frame have on optimism. Study 5 sought to provide additional support for our proposed mechanism via moderation: this study manipulated the extent to which participants could readily produce mental imagery and found converging evidence for the role of ease of imagining the recovery process. Last, in study 6, US flood victims had initiator or responder frames activated while reading an advertisement about a vaccine that protects against flood-related illnesses and then indicated their likelihood of getting vaccinated, optimism about the vaccine's effectiveness, and the ease with which they could imagine getting vaccinated. Importantly, study 6 used a different measure of cultural background for convergent validity. Rather than use participants' ethnicity as an indicator of their self-views, we included a direct measure. Supporting our model, a moderated serial mediation analysis revealed that the interactive effect of frame and self-view (i.e., independence-interdependence) on reported likelihood of getting vaccinated was serially mediated by ease of imagining and optimism.

STUDY 1: CULTURE, FRAME, AND CONSUMER BEHAVIOR

The primary objective of study 1 was to test our prediction that, when people are facing a health challenge, there would be an interactive effect of their culture and frame (i.e., initiator vs. responder) on their optimism for recovery, as reflected in health-related decisions. We recruited Asian American and European American participants, asked them to imagine that they had just been severely injured in a car accident, and prompted them to adopt either an initiator or responder frame while considering how they would address their health challenge. We then asked them to consider: (a) which of two vacation packages they would prefer in the wake of this injury, a highly physical "adventure" package or a "relaxing" package that did not require much physical exertion; and (b) how long they thought they would be able to follow a healthy diet plan recommended by their doctor. We expected that when there was alignment between participants' cultural background and frame, they would more strongly prefer the

physically strenuous adventure package and stick with the doctor-recommended diet plan for a longer period of time—decisions that reflect greater optimism about their recovery and future health.

Though our predictions are cross-cultural in nature, study 1 relied on a single-country sample that included participants from both interdependent (Asian Americans) and independent (European Americans) cultural backgrounds for two reasons. First, cross-national comparisons cannot control for many nonculture factors that might affect study results. Thus, to attenuate potential confounds, we focused on participants with substantial experience and residency in a single country. Second, since bicultural Asian Americans are likely to have experienced at least some acculturation to Western society, their comparison to European Americans should provide a strong, conservative test of our predictions.

Participants and Procedure

Participants were 100 European Americans ($M_{\text{age}} = 36.70$; 49 females) and 100 Asian Americans ($M_{\text{age}} = 31.25$; 34 females). They were recruited from European American and Asian American MTurk panels, told that the researchers were interested in understanding how people deal with illnesses or injury, and paid $1.00 for participating. The study used a 2 (ethnicity: European American, Asian American) × 2 (frame: initiator, responder) design, with all manipulations between-subjects.

Participants were asked to imagine being in a car accident in the future and regaining consciousness in the hospital only to discover that they have multiple leg fractures, a badly broken hip, and spinal vertebrae damage. They were told these injuries could cause nerve damage and require several surgeries and a long period of physical therapy. They were asked to consider how they would address this health challenge and to describe the behaviors, activities, and coping mechanism they had in mind. In the initiator condition, they were told to "consider how you would act," write down the "actions you would take," and describe "each action that comes to mind." In the responder condition, they were told to "consider how you would react," write down the "responses you would have," and describe "each response that comes to mind."

After participants had read the injury scenario and considered what to do to recover from the injury, we presented them with two different scenario questions (the order in which these questions were shown was randomized). In one scenario, participants were told they would be going on a vacation a year from now, but that they would need to begin planning and making reservations for their chosen destination right away. They were presented with two vacation packages—an "adventure vacation package" that involved lots of opportunities for physical activities (e.g., hiking, biking, swimming, and rock climbing) and a

"relaxing vacation package" that involved scenic and relaxing activities (and required little physical activity). Participants were also told that their doctor had advised them that the average person suffering from injuries like theirs would reach full recovery in one year, but that their recovery could be faster or slower. Participants then told us which of these vacation packages they would be more likely to choose for their upcoming vacation (0 = relaxing vacation package, 1 = adventure vacation package).

In the other scenario, participants were told that, after careful consideration of their particular nutritional and physiological needs, their doctor and nutritionist recommended that they follow the South Beach Diet during their recovery. After reading a short description of the diet plan, participants learned that most people recovering from a serious injury are able to stick to strict healthy diet plans like this if their recovery is proceeding well, but that those who struggle during their recovery (e.g., chronic pain, slow recovery progress) typically have a much more difficult time consistently sticking with the diet plan. They were also told that their doctor recommends they try to strictly follow the diet for 14 months. Participants then told us how long they thought they would be able to stick with the diet plan (1 = less than 2 months, 2 = 2 months to < 4 months, 3 = 4 months to < 6 months, 4 = 6 months to < 8 months, 5 = 8 months to < 10 months, 6 = 10 months to < 12 months, 7 = 12 months to 14 months). Last, participants provided demographic information.

Results and Discussion

We conducted logistic regression analyses to examine participants' choice of vacation package (relaxing package = 0, adventure package = 1) as a function of their cultural background (European American = 0, Asian American = 1) and frame (initiator = 0, responder = 1). The results revealed the predicted significant interaction between frame and culture (β = 2.31, $\chi^2(1)$ = 11.71, $p < .01$). European American participants in the initiator condition (38%) were more likely to choose the physically strenuous adventure vacation package than were the European American participants in the responder condition (16%; $\beta = -1.23$, $\chi^2(1) = 6.41$, $p = .01$), whereas Asian American participants in the initiator condition (18%) were less likely to choose the physically strenuous adventure package than were Asian American participants in the responder condition (38%; $\beta = 1.08$, $\chi^2(1) = 5.32$, $p = .02$).

We also conducted a two-way ANOVA to examine how long participants thought they could stick with the doctor-recommended diet plan as a function of their cultural background (European American = 0, Asian American = 1) and frame (initiator = 0, responder = 1). The results revealed the predicted frame-by-culture interaction ($F(1, 196) = 11.67$, $p < .01$). European American participants who were in the initiator condition ($M = 5.73$, SD = 1.64)

reported that they would be able to stick with the doctor-recommended diet plan for a longer period of time than did European Americans in the responder condition ($M = 4.80$, SD = 1.93; $F(1, 196) = 6.84$, $p = .01$). In contrast, Asian American participants who were in the responder condition ($M = 5.61$, SD = 1.68) reported that they would be able to stick with the doctor-recommended diet plan for a longer period of time than did Asian Americans in the initiator condition ($M = 4.82$, SD = 1.84; $F(1, 196) = 4.91$, $p = .03$). Neither main effect was significant ($Fs < .08$, NS).

Taken together, the findings of study 1 provide initial support for our prediction that, when one is facing a health challenge, there is an interactive effect of the person's culture and frame on decisions and judgments pertaining to her or his future health. This pattern held for participants' selections of physically challenging activities, and assessments of their own future success at maintaining a doctor-recommended diet plan—both of which relate to optimism about the progress of health recovery. In our next study, we use a direct, self-report measure of optimism to test our predictions. Moreover, instead of having participants imagine that they are facing a health challenge, study 2 highlights the generalizability of our findings by surveying cancer patients.

STUDY 2: CANCER PATIENTS' OPTIMISM AND ANTICIPATED ENERGY

Study 2 was designed to highlight the role that optimism can play in health recovery by replicating the pattern found in study 1 using a direct measure of optimism. Further, we sought to establish the external validity of our findings by testing our predictions using participants who are experiencing a real health challenge. To achieve both goals, we recruited European American and Asian American cancer survivors, prompted them to adopt either an initiator or responder frame, and asked them to consider how they would address their cancer illness in the future. We then examined how optimistic they felt about beating the disease, and how much energy they had to do so.

Participants and Procedure

Seventy-one European American and 61 Asian American cancer survivors (54% female; $M_{age} = 36.8$; $M_{TimeSinceDiagnosis} = 6$ years, 8 months) were recruited by an online market research firm, paid $20 for participating, and told that the study was about how people with cancer address health challenges. All participants had been diagnosed with cancer after turning 21 years of age. The study relied on a 2 (culture: European American, Asian American) $\times$ 2 (frame: initiator, responder) between-subjects design.

Participants were first prompted to think about how they would address the problems raised by their cancer illness: "Consider your illness, and its effect on your health. Then think about how you will deal with the problems and issues you will face in the future. What is your long-term plan for staying as healthy as you can?" To activate a responder frame or initiator frame, we manipulated the wording of the subsequent instructions. In the initiator condition, participants were told to consider "how you will act to address this health threat" and to "indicate actions you have in mind by writing a phrase or sentence to describe each action that you are considering." Participants in the responder condition were told to consider "how you will react" and to "indicate responses you will have by writing a phrase or sentence to describe each response you are considering."

All participants reported their feelings of optimism about overcoming their illness using four measures that draw upon Reed et al. (1999) and that indicate problem-specific optimism ("have a positive outlook," 1 = low chance to 7 = high chance), confidence about the course of recovery ("getting better quickly," 1 = low probability to 7 = high probability), expectations about the course ("recovery speed," 1 = slow to 7 = fast), and perceived control over the situation ("can beat this challenge," 1 = strongly agree to 7 = strongly disagree). These items were averaged to form an optimism index (α = .86).

Next, participants reported how much energy they expected to feel in the near future, so that we could understand whether greater optimism does indeed precipitate the belief that one possesses greater energy resources. Specifically, they told us how often during the next few months (1 = none of the time, 6 = all of the time; Lorig et al. 1996) they expected to "feel worn out" (reverse-scored), "have a lot of energy," "have enough energy to do things you want to do," and "feel full of pep." These items were averaged to form an anticipated energy index (α = .71). Last, participants provided demographics and were debriefed.

To ensure that the frame manipulation (initiator vs. responder) used in this study indeed influenced people's perspectives as expected, we ran a post-hoc pre-test. Sixty-two European Americans and 55 Asian Americans read a scenario in which they were asked to imagine having a cancer illness, then were presented with our study stimuli. They thought about how to deal with this health challenge, and were prompted to do so with either the initiator or responder version of the instructions. After writing their planned activities, they indicated (1 = strongly disagree to 7 = strongly agree) the extent to which, while planning, they "focused on situations you might encounter," "avoided thinking about details of your own actions," "focused on actions you might take" (reverse-scored), and "avoided thinking about details of the situations you could face" (reverse-scored). These items were averaged to form a person-situation index (α = .76), with higher scores

indicating greater focus on the situation. As expected, a 2 (culture: European American, Asian American) $\times$ 2 (frame: initiator, responder) ANOVA revealed only a significant main effect of the frame manipulation ($F(1, 113)$ = 4.29, $p < .05$; other $Fs < 1.2$, NS): participants in the responder condition (M = 5.06, SD = .71) reported being more situation-focused (vs. person-focused) than did those in the initiator condition (M = 4.58, SD = .82).

Results and Discussion

A two-way ANOVA was used to analyze feelings of optimism as a function of cultural background (European American, Asian American) and frame (initiator, responder). As expected, the interaction was significant ($F(1, 128) = 8.35$, $p < .01$). Asian Americans were more optimistic when prompted to adopt a responder (M = 5.29, SD = 1.09) rather than initiator frame (M = 4.67, SD = 1.58; $F(1, 128) = 4.09$, $p < .05$). European Americans had the opposite pattern: they had a more optimistic outlook in the initiator condition (M = 5.32, SD = .84) than in the responder condition (M = 4.74, SD = 1.14; $F(1, 128) = 4.28$, $p < .05$). Neither main effect was significant ($Fs < .07$, NS).

Another two-way ANOVA examined participants' anticipated energy. The results revealed a significant interaction ($F(1, 127) = 4.05$, $p < .05$). European Americans thought they would have more energy when prompted to adopt an initiator frame (M = 3.24, SD = .66) rather than a responder frame (M = 2.92, SD = .48); $F(1, 127) = 4.00$, $p = .05$. The opposite pattern held for Asian Americans: they anticipated having more energy in the responder condition (M = 3.19, SD = .75) than the initiator condition (M = 3.04, SD = .73), though this difference did not reach significance ($F(1, 127) = .79$, $p = .38$).

Finally, we looked for evidence that participants' expectations of having energy in the future were driven by their feelings of optimism. If this were true, we might expect that the influence of the culture-by-frame interaction on energy expectations is mediated by felt optimism. We tested this prediction using a moderated mediation bootstrap analysis (10,000 resamples; PROCESS model 8). We predicted energy reports using frame type (initiator = 0, responder = 1) as the independent variable, cultural background (European American = 0, Asian American = 1) as the moderator, and optimism as the mediator. Results supported this prediction: the confidence interval for the estimate of the indirect effect did not include zero, suggesting significant moderated mediation (β = .17, SE = .09, 95% CI [.04, .40]). Additional examinations of the conditional indirect effects indicated significant mediation for both European Americans (β = –.07, SE = .04, 95% CI [–.19, –.01]) and Asian Americans (β = .10, SE = .06, 95% CI [.01, .27]).

In sum, using a sample of cancer survivors, study 2 showed that Asian Americans reported greater optimism about recovering when they considered their futures with a responder (vs. initiator) frame, whereas European Americans expressed greater optimism when considering their futures with an initiator (vs. responder) frame. Study 2 also found that a similar pattern emerged for the amount of energy participants anticipated having during their recovery (the initiator vs. responder contrast for Asian Americans did not reach significance, however), and that feelings of optimism drove this perceived anticipated energy.

Importantly, to extend the generalizability of the optimism findings from study 2, we conducted a follow-up study to examine the interactive effect of culture and frame on optimism when samples from different countries (as opposed to single-country samples) were compared. Participants were 108 European American college students and 80 Chinese college students and the study used a 2 (culture: American, Chinese) × 2 (frame: responder, initiator) between-subjects design. In this study, we used the same serious injury/health challenge scenario and frame manipulation used in study 1, and measured optimism as in study 2. As predicted, a two-way ANOVA on the optimism index revealed a significant frame-by-culture interaction ($F(1, 184) = 6.13, p < .01$). Consistent with the results of study 2, European Americans were more optimistic when they adopted an initiator ($M = 4.90, SD = .96$) rather than a responder frame ($M = 4.43, SD = 1.10$; $F(1, 184) = 5.42, p < .05$), whereas Chinese respondents were more optimistic when they adopted a responder ($M = 5.10, SD = .96$) rather than an initiator frame ($M = 4.55, SD = 1.31$; $F(1, 184) = 4.96, p < .05$).

Having replicated in our follow-up study the pattern of optimism results from study 2, using a different health challenge and operationalization of culture, we next sought to provide more evidence of the tie between our frame manipulation and energy resources so as to bolster the findings from study 2's anticipated energy analysis. Moreover, to show that our effects encompass physiological (in addition to psychological) aspects of recovery, we focused on a recovery-relevant behavioral measure: physical endurance.

STUDY 3: CANCER AND PHYSICAL ENDURANCE

Study 3 examined whether the interactive effect of cultural background and frame extends from the energy people anticipate having to that which they physically expend once the frame is activated. In particular, Asian Americans and European Americans considered what they would do if they were to find out that they have cancer and then, while planning exercises they could undertake to stay healthy after this diagnosis, squeezed a handgrip repeatedly. Importantly, we manipulated the handgrip task instructions such that participants were prompted to adopt either an initiator or responder frame. Moreover, our health scenario had participants consider getting colon cancer, which has a similar likelihood of occurring for Asian Americans and European Americans (U.S. Cancer Statistics Working Group 2014).

Participants and Procedure

Fifty-five European American ($M_{age} = 25.1$, 27 female) and 54 Asian American ($M_{age} = 21.7$, 37 female) students at a West Coast university were recruited through an online panel and paid $20 to participate. All completed the study individually in a lab equipped with a computer, which showed all stimuli and collected all responses, and a hand dynamometer. Two Asian Americans and four European Americans did not complete the handgrip exercise and thus were not included in the analyses. The study used a 2 (culture: Asian American, European American) × 2 (frame: initiator, responder) between-subjects design.

In the study, participants read that researchers were interested in understanding how people deal with illness. They were then asked to imagine making a routine visit to the doctor, having some follow-up tests, and discovering that they have a small cancerous tumor in their colon. They were also told that surgery and other treatments would be needed to fight the disease. Next, to help participants better understand and empathize with the challenges cancer survivors face, they were presented with some personal stories of cancer survivors. Specifically, they watched a 4 minute informational video in which real cancer patients talk candidly about their fight with the disease.

Participants then completed some filler tasks before reading the cover story that explained the key task, which involved a handgrip (i.e., a dynamometer, which senses and records the squeeze force applied by a participant over time). They were told to think about how they could stay active while fighting the disease and to develop a plan for exercising with this in mind. Then, participants saw a slideshow in which each slide had a description of an exercise and a picture of a person performing that exercise. They viewed 20 exercises, each appearing for 10 seconds, and thought about which of these exercises they wanted to do and how often. They were asked to multitask while doing their planning, to reflect the type of environment they would naturally encounter in real life, and told that they would be randomly assigned to one of several different tasks—although, in reality, all participants took part in the handgrip task. Following the approach of previous handgrip studies, no specific goal was set (Park and Roedder John 2014); participants were just told to firmly and repeatedly squeeze and release the handgrip with their dominant hand, to use a steady rhythm, and to be as smooth and

consistent as possible. The handgrip is initially easy to press but becomes more difficult (due to fatigue) as it is pressed more times.

Importantly, we manipulated the wording of the final handgrip task instructions so that either an initiator or responder frame was activated, using the same type of wording manipulation used in study 1. In the initiator condition, participants were told to consider "how you will need to act daily to exercise regularly," "what actions you will need to take," and "how you should act to ensure hard work and success" when exercising. In the responder condition, they were asked to consider "how you will need to react daily to exercise regularly," "what responses you will need to have," and "how you should react to ensure hard work and success" when exercising. Last, they completed demographics, were asked the purpose of the study (none guessed correctly), and were debriefed.

Results and Discussion

We allowed participants 10 seconds to adjust to the squeezing task, and examined the average force they applied to the grip in the subsequent minute. Mean force during this timeframe was analyzed as a function of ethnicity (Asian American, European American) and activated frame (initiator, responder). The results revealed a significant two-way interaction ($F(1, 96) = 8.41$, $p < .01$): the force applied to the handgrip by European Americans was greater in the initiator ($M = 25.98$, SD $= 24.79$) than the responder condition ($M = 15.12$, SD $= 15.70$; $F(1, 96) = 4.51$, $p < .05$), and the force applied by Asian Americans was greater in the responder ($M = 22.03$, SD $= 16.24$) than the initiator condition ($M = 12.04$, SD $= 13.64$; $F(1, 96) = 3.90$, $p = .05$). Neither main effect was significant ($Fs < 1$).

The results of study 3 established that, once activated, frames can influence the energy participants expend on a physical task. Namely, European Americans put forth more effort when squeezing a handgrip after adopting an initiator (vs. responder) frame, and Asian Americans put forth more effort after adopting a responder (vs. initiator) frame. Therefore, the results of studies 2 and 3 demonstrate that, when contemplating future health recovery activities, the impact of a person's frame and cultural background is reflected in both psychological indicators (i.e., optimism and anticipated energy) and physiological indicators (i.e., physical endurance) of positive health outcomes.

Moreover, we ran another ancillary study to further test whether, as our theory proposes, our responder (vs. initiator) frame manipulation affects participants' tendencies to have situation-focused (vs. person-focused) thinking and to rule out alternative explanations (by including measures of relevant variables that could be responsible for our effects). In particular, it is possible that our manipulation could also alter how vulnerable participants feel to a health threat, their affective state, or their motivational inclinations.

To examine these possibilities, 126 European Americans ($M_{age} = 37.1$, 53% female) and 124 Asian Americans ($M_{age} = 30.1$, 44% female) read a scenario in which they were asked to imagine having cancer and to consider how they would deal with this health challenge, prompted with the same responder or initiator language as in studies 1–3.

Participants wrote about their planned activities and then, to examine the effect of our manipulation, we asked them to indicate the extent to which they had been situationally focused when imagining the process of recovering by indicating their agreement with three items serving as a manipulation check (adapted from Choi, Koo, and Choi 2007). Participants were asked to indicate (a) the importance of considering the situation a person faces to understand her or his behavior, (b) whether things that happen have numerous unknown causes, and (c) whether things that happen entail a number of unknown consequences ($1 = $ strongly disagree, $7 = $ strongly agree; $\alpha = .83$). Participants then reported their perceptions of the likelihood that they currently have cancer ($0 = $ I definitely do not have it, $100 = $ I definitely have it) or might get the disease in the future ($1 = $ not at all likely, $7 = $ very likely), positive and negative affect ($\alpha_{positive} = .86$, $\alpha_{negative} = .84$; PANAS, Thompson 2007), mood ($\alpha_{positive} = .87$, $\alpha_{negative} = .85$, $\alpha_{arousal} = .57$, $\alpha_{pleasant} = .87$; BMIS, Mayer and Gaschke 1988), eagerness and vigilance ($\alpha_{eagerness} = .76$, $\alpha_{vigilance} = .78$; Miele, Molden, and Gardner 2009), and deliberativeness and implemental orientations ($\alpha_{deliberative} = .66$, $\alpha_{implemental} = .77$; Bayer and Gollwitzer 2005).

We ran a full-model ANOVA: 2 (culture: European American, Asian American) $\times$ 2 (frame: responder, initiator), with age and gender as covariates, on the three-item manipulation-check index. As expected, there was a main effect only of frame ($F(1, 151) = 7.60$, $p < .01$; other $Fs < 1$, NS), such that those in responder conditions ($M = 5.23$, SD $= .81$) reported holding a stronger situation-focused perspective than did those in initiator conditions ($M = 4.88$, SD $= .73$). Thus, the frame manipulation worked as intended. We also ran full 2×2 ANOVAs on all other measures; the results revealed no significant main or interactive effects ($Fs < 1.5$, NS), suggesting that possible spurious variables were not at play and garnering greater confidence in our explanation.

Having established the predicted pattern of optimism effects and ruled out several alternative explanations in studies 1–3, we turn to examinations of the mechanism underlying these effects in our remaining studies. In particular, study 4 tests hypothesis 2, empirically exploring the driver of the interactive effect of culture and frame on optimism.

STUDY 4: EASE OF IMAGINING AS A MEDIATOR

People spontaneously generate picture-like representations of actions they are planning, and the development of

such images can be hindered when processing is difficult during decisions (Jiang et al. 2014). If true, the images of planned activities held in memory should be more cognitively available (Tversky and Kahneman 1973) when the mental simulation frame one adopts aligns (vs. does not align) with one's usual way of thinking. In particular, our theory predicts that the mental images pertaining to the process of overcoming a health challenge should be easier to generate when people in independent cultures adopt an initiator (vs. responder) frame, and when people in interdependent cultures adopt a responder (vs. initiator) frame. And when the ease of imagining health-related activities is facilitated in this way, we predict greater optimism is cultivated.

To test this predicted mechanism, we asked participants in study 4 to make plans for addressing a health threat while adopting either an initiator or responder frame, then report their optimism (as in the prior studies). But in addition, as a measure of the availability of the underlying mental images, they indicated how easily they could imagine themselves undertaking their planned activities and behaviors. If the interactive effect of frame and culture on optimism is indeed due to differences across conditions in the ease with which these mental images are formed, we should find that ease of imagining mediates our effects.

For convergent validity, study 4 used a different health challenge—diabetes—and a different initiator-responder manipulation. In studies 1–3, we activated different frames by using initiator-related words (act, action) or responder-related words (respond, response). Though our manipulation check pretest (discussed in study 2) and post-test (discussed in study 3) offer evidence that this approach effectively manipulated participants' sensitivity to future situations and context during the planning task, it is possible that exposure to our key phrases had other, confounded associations that could affect our results (e.g., different tendencies to indicate urgency or elicit emotional reactions). Thus, in study 4, we instead manipulated the extent to which participants' own actions (initiator frame) versus the situational contexts they might face (responder frame) were made salient in the instructions.

Participants and Procedure

Participants were 100 European Americans (M_{age} = 32.8, 50% female) and 74 Asian Americans (M_{age} = 29.3, 42% female). They were recruited by a market research firm, paid $1 for participating, and told that the study was about how people deal with their health challenges. The study used a 2 (culture: European American, Asian American) × 2 (frame: initiator, responder) between-subjects design.

First, participants were presented with a diabetes scenario. They were asked to imagine a routine visit to the doctor in which they find out they are developing diabetes and

need to improve their eating habits. According to their doctor, the consequences of not doing so include serious health threats such as "glaucoma and deteriorated vision, cardiovascular disease, high blood pressure, and kidney disease." After imagining this scenario, they were asked to write down four things they would do to address this health threat, using a phrase or sentence. The instructions for this part of the task included our manipulation of frame. In the responder condition, the instructions drew participants' attention to the various types of situations and events that might emerge by having them focus on "situations you might face," "circumstances that arise," and not getting "lost thinking too much about the details of your own actions." In the initiator condition, the instructions instead drew participants' attention to their own acting, regardless of the context in which it occurs, by having them focus "on your own actions," taking "action regardless of the circumstances" and not getting "lost thinking too much about the details of all of the situations you could face."

After completing the diabetes scenario task, participants reported their current optimism using the same four-item scale as in study 2 (α = .87). Then, after some filler items, they completed our measures of ease of imagining. To understand how readily they could construct mental images of the activities they had listed during the diabetes task, we asked them to think about the activities they had planned and to indicate how "detailed" and "strong" their mental images of these activities were (1 = not at all, 7 = very; Petrova and Cialdini 2005). These two items were averaged to form an ease-of-imagining index (α = .84). Last, participants provided demographics and were debriefed and dismissed.

Results and Discussion

First, we used a two-way ANOVA to examine feelings of optimism as a function of cultural background (Asian American, European American) and frame (initiator, responder). As expected, and consistent with the results of the prior studies, the interaction was significant ($F(1, 170)$ = 11.56, $p < .01$). Among European Americans, optimism was greater for those who were in the initiator condition and primed to focus on their own actions (M = 5.60, SD = .99) compared to those who were in the responder condition and primed to focus on the situations they would face (M = 5.12, SD = 1.14; $F(1, 170)$ = 5.46, $p < .05$). The reverse was true for Asian American participants: those in the responder condition (M = 5.49, SD = .98) were more optimistic than were those in the initiator condition (M = 4.91, SD = .99; $F(1, 170)$ = 5.93, $p < .05$). Neither main effect was significant ($Fs < 1$, NS).

Second, to determine if the ease with which participants could imagine their recovery-oriented activities mediates the interactive effect of culture and frame on optimism, we analyzed the ease-of-imagining index using a 2

(culture: Asian American, European American) × 2 (frame: initiator, responder) ANOVA. For the European American participants, those who were in the initiator condition ($M = 5.89$, SD = .90), versus the responder condition ($M = 5.32$, SD = 1.42), more easily imagined their planned recovery activities ($F(1, 170) = 5.63$, $p < .05$). The reverse was true for Asian American participants, though this result was marginally significant ($M_{Initiator} = 4.98$, $SD_{Initiator} = 1.23$ vs. $M_{Responder} = 5.54$, $SD_{Responder} = 1.33$, $F(1, 170) = 3.69$, $p < .06$).

Next, we used a bootstrap analysis (10,000 resamples; PROCESS model 8) to test for moderated mediation. We predicted optimism using frame (initiator = 0, responder = 1) as the independent variable, cultural background (European American = 0, Asian American = 1) as the moderator, and the ease-of-imagining index as the mediator. Supporting our prediction, the confidence interval for the estimated indirect effect did not include zero, suggesting moderated mediation ($\beta = .49$, SE = .18, 95% CI [.18, .89]). Additional analyses of the conditional indirect effects at both levels of the moderator (cultural background) revealed that our significant mediation result held for both European Americans ($\beta = -.25$, SE = .12, 95% CI [−.51, −.05]) and Asian Americans ($\beta = .24$, SE = .13, 95% CI [.01, .52]).

These results replicate the pattern of optimism findings from study 2. When facing a health challenge, European Americans who adopted an initiator (rather than responder) frame reported greater optimism, whereas Asian Americans who adopted a responder (rather than initiator) frame reported greater optimism. But further, this same pattern applied to the ease with which participants could imagine the activities and behaviors they planned to undertake to address their health challenge (the contrast for Asian Americans, however, was only marginally significant). Importantly, moderated mediation analyses revealed that the increased optimism was driven by the ease with which one could imagine oneself addressing the health challenge.

If, in our studies, participants have greater optimism because they can more easily imagine themselves undertaking the steps needed to recover, as our theory and study 4's findings suggest, limiting their capacity to conjure mental images should attenuate our effects. Study 5 tested this idea. A second contribution of study 5 was to examine participants' preference for more challenging therapy programs, an important behavioral indicator of optimism, rather than asking them directly how optimistic they would feel.

STUDY 5: MANIPULATING EASE OF IMAGINING

The primary objective of study 5 was to provide further evidence of our proposed ease-of-imagining mechanism via moderation. Similar to study 1, Asian American and European American participants thought about being seriously injured in the future and considered how they would address this health challenge. However, prior to this task, half of the participants were asked to remember specific visual information throughout the study, suppressing their visual memory capacity (Jiang et al. 2016) and hindering their ability to imagine future activities. The other half were encouraged to imagine and visualize prior to the injury task.

Subsequently, in our target task, participants indicated their preference between two physical therapy programs that differed in difficulty and the extent to which one would need to make strong, consistent progress in order for the therapy to be effective—a preference that reflects participants' optimism about their recovery process. This preference measure served as our key dependent variable. According to our proposed theoretical model, the interactive effect of culture and frame on optimism is driven by the ease with which people can imagine the process of getting better. Thus, if ease of imagining the recovery process is indeed the underlying mechanism, we should expect a significant culture-by-frame interaction on our dependent variable in the facilitated imagining condition, but this interaction should be attenuated in the suppressed imagining condition.

Participants and Procedure

Participants were 244 European Americans ($M_{age} = 36.86$; 111 females) and 186 Asian Americans ($M_{age} = 31.41$; 75 females). They were recruited from European American and Asian American MTurk panels, told that the researchers were interested in understanding how people deal with illnesses or injury, and paid $1.00 for participating. The study used a 2 (ethnicity: European American, Asian American) × 2 (imagining capacity: suppressed, augmented) × 2 (frame: initiator, responder), between-subjects design.

In this study, participants were presented with the same injury scenario, initiator (vs. responder) frame manipulation, and activity-generating task used in study 1. However, before participants read the scenario, we manipulated their ability to generate imagery when completing the injury scenario task, following procedures used in Jiang et al. (2016). Participants were randomly assigned to one of two conditions, wherein their imagining capacity was either facilitated or suppressed. In the facilitated imagining condition, we first told participants to practice generating mental imagery by imagining themselves driving a car. We told them to close their eyes, imagine this scene in their mind, and describe it. These participants were then presented with the injury scenario and target activity-generating task.

In the suppressed imagining condition, participants were exposed to a purported memory task that involved memorizing a visual stimulus. They were shown a 5×5 grid with an X in some of the cells, asked to remember which cells were marked, and told they would need to recreate the grid at the end of the session. Participants were then presented with the injury scenario and target activity-generating task. By occupying participants' visuospatial working memory with unrelated visual imagery (Jiang et al. 2016), this task was designed to dampen their capacity to generate new imagery during the target activity-generating task. Notably, as prior work has shown that this task does not affect participants' capacity to encode, process, or recall visual information more generally (Jiang et al. 2016, 716), it should deter ease of imagining but not impede other aspects of visual processing.

After participants had read the injury scenario and considered what to do to recover from the injury, we showed them two different physical therapy programs—an "advanced pace program" and a "moderate pace program"—and asked them to indicate their preference between them. Participants were told that the advanced program requires more hours and is more difficult than the moderate program. They were also told that the advanced program offers the best results only for those who are able to keep up by making strong, consistent progress, whereas the moderate program would offer better results for those who are not able to do so. Participants then told us which program they would be more likely to choose using a six-point scale (1 = definitely the moderate program, 6 = definitely the advanced program).

To examine the effectiveness of our imagining capacity manipulation, we then asked participants to report the ease with which they had formed self-related mental pictures when thinking about the activities they planned to engage in to help them recover from their injury (1 = not at all, 9 = a lot). Then, after some filler questions, participants provided demographic information and were debriefed and dismissed.

Results and Discussion

Our imagining capacity manipulation check was submitted to a full 2 (ethnicity: European American, Asian American) $\times$ 2 (imagining capacity: suppressed, facilitated) $\times$ 2 (frame: initiator, responder) ANOVA. As expected, the results revealed a significant main effect of imagining capacity condition ($F(1, 422) = 9.46, p < .01$). Participants reported greater ease of imagery generation when thinking about activities if they were in the facilitated ($M = 7.13$, SD $= 1.40$) rather than suppressed imagery capacity condition ($M = 6.64$, SD $= 1.82$). Also, European Americans ($M = 7.12$, SD $= 1.69$) reported greater ease of imagery generation than Asian Americans ($M = 6.66$, SD $= 1.57$; $F(1, 422) = 8.20, p < .01$). No other effects were significant.

We conducted a $2 \times 2 \times 2$ ANOVA to examine participants' therapy program preferences as a function of their ethnicity (Asian American, European American), imagining capacity condition (facilitated, suppressed), frame condition (initiator, responder), and all interactions. As expected, the three-way interaction was significant ($F(1, 422) = 7.69, p < .01$). Only one other effect was significant in the model: participants whose capacity for imagining was facilitated ($M = 4.35$, SD $= 1.46$) rather than suppressed ($M = 3.96$, SD $= 1.63$) preferred the more advanced physical therapy program ($F(1, 422) = 5.04, p < .05$).

To understand the nature of the three-way interaction, we conducted separate analyses of participants who had their capacity to imagine facilitated and suppressed, using ethnicity (Asian American, European American), frame condition (initiator, responder), and the interaction of these two variables as predictors. Supporting our proposed model, the results revealed that, for participants in the facilitated imagining condition, only the ethnicity-by-frame interaction was significant ($F(1, 191) = 8.38, p < .01$; other Fs < 1.5, NS). Asian Americans more strongly preferred the advanced therapy program if they had a responder ($M = 4.50$, SD $= 1.16$) rather than initiator frame ($M = 3.85$, SD $= 1.56$; $F(1, 191) = 3.99, p < .05$), whereas European Americans showed a greater preference for the advanced therapy program if they had an initiator ($M = 4.73$, SD $= 1.42$) rather than responder frame ($M = 4.16$, SD $= 1.54$; $F(1, 191) = 4.53, p < .05$). Also in line with our proposed model, there was not a significant ethnicity-by-frame interaction (nor any significant main effects) for participants in the suppressed imagining condition ($M_{\text{Asian American/Initiator}} = 4.02$ vs. $M_{\text{Asian American/Responder}} = 4.05$, $M_{\text{European American/Initiator}} = 3.65$ vs. $M_{\text{European American/Responder}} = 4.15$; Fs < 1.5, NS).

Together, the results of study 5 provide further support for our prediction that the interactive effect of culture and frame on optimism is driven by ease of imagining. A stronger preference for the more difficult, advanced therapy program—a preference that reflects greater optimism about one's recovery process—was exhibited by Asian Americans who adopted a responder (vs. initiator) frame and European Americans who adopted an initiator (vs. responder) frame. However, this interactive effect of culture and frame on therapy program preference emerged only when participants' ability to imagine the activities they might undertake to overcome their injury was facilitated. When participants' ability to imagine was suppressed, culture and frame did not affect therapy program preferences.

STUDY 6: TESTING THE FULL CONCEPTUAL MODEL

Building upon the findings of study 5, study 6 again examines decision making in the domain of health.

However, in this case, we examined participants' responses to a marketing communication and manipulated frames using the wording in this communication. Second, rather than use participants' ethnicity or nationality as an indirect indicator of their independence-interdependence, we used a direct measure of self-views, providing convergent validity. Study 6 also offers a more comprehensive test of the interrelationship among the variables in our model by examining, in one study, the interactive effects of culture and frame on the ease of imagining implementing a health solution, optimism about this solution, and intentions to implement the solution.

Last, study 6 sought to rule out alternative explanations for our observed effects and provide a test of theory specificity. Namely, one might argue that the ability of culture and frame to enhance people's optimism about recovering could be driven by general processing fluency, processing involvement, or ease of imagining in general (e.g., the ease with which one can imagine experiencing the health challenge rather than, as we predict, the ease with which one can imagine overcoming the health challenge). Thus, we measured these constructs in study 6. To test the specificity of our account, we also tested if the interactive effect of culture and the frame one adopts when facing a health challenge impacts people's optimism about things other than their health. Because our theory specifically relates the interactive effect of culture and frame to people's optimism about recovering from their health challenge, we predicted that the interaction of these constructs would not affect general optimism or optimism about non-health-related topics (e.g., finances or the environment).

Study 6 was conducted in a major metropolitan area shortly after torrential rains and severe flooding. We presented university students living in the affected area with information about illness-causing agents that can be present in and around flood waters (e.g., parasites, typhoid, mold, cholera), told them about a vaccine that could boost their immune systems and protect against these health hazards, and asked them about their intention to obtain this vaccine if it were made available through the university's health clinic. Schools, colleges, and public transportation in the region were closed when the flooding began, and we administered our study at a local university after classes resumed. At the time of the study, the floodwaters had yet to recede in many parts of the region, and local news reports were still warning residents about the dangers of floodwaters (including flood-related illnesses).

Participants and Procedure

Two hundred fifty-seven students ($M_{age} = 22.25$, 145 female) were recruited from an undergraduate subject pool, and all received course credit for participating. Among our respondents were 53 European Americans, 73 Hispanics, 69 East Asians, 26 South Asians, 21 African Americans, 6 Middle Easterners, and 9 who identified as some other ethnicity.

As a cover story, participants were told that the purpose of the survey was to get students' opinions about how the university's clinic might address health threats caused by the recent flooding. First, participants read a mock "CDC Fact Sheet," which was developed using information from the CDC and other government websites. The fact sheet told them about the various health risks and illness-causing agents spread by floodwaters. Several health threats common after flooding were described, including communicable diseases spread by contaminated water (e.g., typhoid and cholera), illnesses from parasites and mosquitoes, and dangers caused by exposure to mold and mildew.

Next, participants were told that the university's health center was considering obtaining a vaccine that strengthens one's immune system against flood-related illnesses, and that the health center wanted to gauge students' interest in this vaccine. We subsequently presented them with an advertisement for a vaccine called Immunasil (see the web appendix). In reality, the Immunasil vaccine is fictitious, and we developed the marketing communication shown to participants. The message mentioned the health threats associated with flooding disasters, described the vaccine, and discussed both the benefits and potential side effects of the product. According to the message, the vaccine was developed specifically for victims of hydrological disasters and can boost the body's immune system and reduce the severity of and chances of contracting flood-related illnesses. The side effects mentioned were pain, burning, and swelling at the injection site; headaches, muscle pain, and joint pain; and nausea. A picture of the product was shown, and its biochemical makeup was described.

Importantly, the text of the message was manipulated so that either initiator or responder language was used for some key phrases. In the initiator condition, for example, the text indicated "Act now to protect yourself—get vaccinated!" "How will you act to address this health threat?" and "When considering what actions to take after the flood, consider Immunasil." In responder conditions, on the other hand, these passages read "Respond now to protect yourself—get vaccinated!" "How will you react to address this health threat?" and "When considering how to respond after the flood, consider Immunasil."

After reading the message about Immunasil, participants were asked how likely they would be to get the vaccination if it were offered by the university's health center (1 = not at all likely, 7 = very likely). Next, we asked them how optimistic they were about the vaccine's ability to help them address flood-related health problems they might experience. Adapting the four optimism items ($\alpha = .92$) from study 2 to the current setting, we asked participants their perceptions of the probability that the vaccine would help them get better quickly (1 = low probability, 7 = high probability), the speed of their recovery with the vaccine

(1 = slow, 7 = fast), the extent to which the vaccine would make them feel they could beat the challenges of flood-related illnesses (1 = not at all, 7 = very much), and the chance the vaccine would enable them to maintain a positive, healthy outlook (1 = very low, 7 = very high).

Participants then completed measures indicating how easily they could imagine both getting the vaccine (vaccine ease-of-imagining index; α = .95) and suffering from a flood-related illness (illness ease-of-imagining index; α = .90). These measures asked "how hard is it," "how difficult is it," and "how much do you struggle when trying" to imagine or visualize yourself taking the step of getting vaccinated and to imagine or visualize yourself experiencing or facing a flood-related illness, respectively (1 = not at all, 9 = very; all items reverse-scored; Jiang et al. 2014). Participants then indicated the extent to which they felt processing fluency and involvement when considering the possibility of getting vaccinated. For processing fluency, they completed two items indicating how difficult or easy the vaccine information was to "process" and "understand" (1 = difficult, 7 = easy; α = .85; Lee and Aaker 2004). For involvement, they told us how involved they felt when processing this information (1 = not at all, 7 = very; Labroo and Lee 2006).

We also asked participants how optimistic they felt about other aspects of their lives. They reported their general feelings of optimism using five items from the Revised Life Orientation Test (1 = I disagree a lot, 5 = I agree a lot; α = .77; Carver et al. 2010): "If something can go wrong for me, it will" (reverse-scored), "I'm optimistic about my future," "I hardly ever expect things to go my way" (reverse-scored), "I rarely count on good things happening to me" (reverse-scored), and "Overall, I expect more good things to happen to me than bad." Participants also indicated their optimism about their financial futures (α = .80) and global warming (α = .64), using measures adapted from the five items used to measure general optimism. For example, to measure optimism about global warming, one item asked participants if they were optimistic about reducing global warming.

After reporting their feelings of optimism, participants used a seven-point scale to complete two items that measured independence (α = .60) and two items that measured interdependence (α = .61; adapted from Singelis et al. 1995). For independence, they indicated their agreement with the self-descriptions: "One should live one's life independently of others" and "What happens to me is my own doing." For interdependence, they indicated their agreement with the self-descriptions: "I feel good when I cooperate with others" and "I hate to disagree with others in my group" (1 = strongly disagree, 7 = strongly agree). Finally, participants completed some demographic questions, guessed the purpose of the study, and were debriefed (e.g., alerted that this vaccine was fictitious) and dismissed. None correctly guessed the study's goals, nor detected our deceptions.

Results and Discussion

We formed an interdependence-independence index by computing the difference between participants' scores on the interdependence and independence subscales (Holland et al. 2004), such that larger scores indicated greater tendencies toward interdependence. We then examined our three key dependent variables: ease of imagining getting vaccinated, optimism about the vaccine's ability to help them address their health challenge, and intention to get the vaccine.

According to our theory, the interaction between frame (i.e., initiator vs. responder) and interdependence-independence should influence the ease with which people can imagine themselves getting vaccinated, which should in turn influence their optimism that the vaccine will help them overcome their health challenge, which should in turn influence their likelihood of getting the vaccine. Specifically, our model predicts a first-stage interaction between frame condition and interdependence-independence, such that an initiator (vs. responder) frame leads to greater ease of imagining oneself taking the step of getting vaccinated (and, consequently, greater optimism that the vaccine will help them overcome their health threat and greater likelihood of getting the vaccine) when one is high in independence, but that a responder (vs. initiator) frame leads to greater ease of imagining oneself taking the step of getting vaccinated (and, consequently, greater optimism that the vaccine will help them overcome their health threat and greater likelihood of getting the vaccine) when one is high in interdependence. To test this conceptual model, we conducted a moderated serial mediation analysis (10,000 resamples) using PROCESS and the procedures outlined in Hayes (2015). In the model estimated by this analysis, frame condition (responder = 0, initiator = 1) was the manipulated independent variable, the vaccine ease-of-imagining index was the first mediator, vaccine optimism was the second mediator, vaccination intentions was the dependent variable, and interdependence-independence was the measured moderating variable. The analysis revealed the following results (see figure 1).

First, there was a significant frame condition by interdependence-independence interaction on vaccine ease of imagining ($\beta = -.97$, 95% CI: [–1.24, –.70]). Specifically, adopting an initiator (vs. responder) frame had a significantly negative influence on the ease with which one could imaging getting the vaccine when interdependence-independence was one standard deviation above the mean ($\beta = -1.77$, 95% CI: [–2.57, –.97]), but adopting an initiator (vs. responder) frame had a significantly positive influence on the ease with which one could imagine getting the vaccine when interdependence-independence was one standard deviation below the mean ($\beta = 2.28$, 95% CI: [1.49, 3.07]). In other words, a responder (vs. initiator) frame led to significantly greater

THE MEDIATING EFFECT OF EASE OF IMAGINING VACCINATIONS ON VACCINE OPTIMISM AND VACCINATION INTENTIONS AS A FUNCTION OF INTERDEPENDENCE-INDEPENDENCE
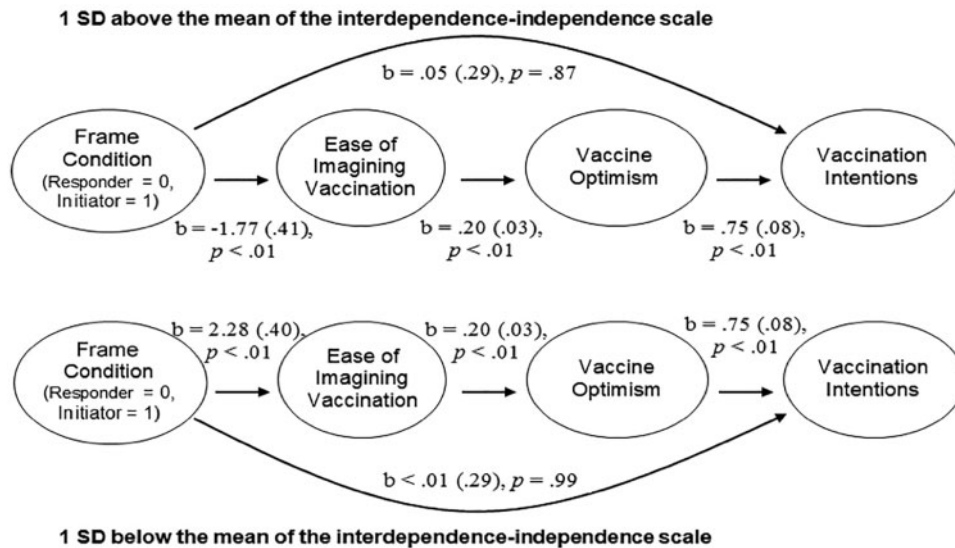
NOTE.—Numbers in parentheses indicate standard errors. indirect effect of frame condition (initiator vs. responder) on vaccination intentions via both mediators is $\beta = -.26$ (CI: [$-.41$, $-.14$]) at one standard deviation above the mean of the interdependence-independence scale and $\beta = .34$ (CI: [.19, .51]) at one standard deviation below the mean of the interdependence-independence scale.

ease of imagining oneself getting vaccinated when one was high in interdependence, but an initiator (vs. responder) frame led to significantly greater ease of imagining oneself getting vaccinated when one was high in independence. Second, ease of imagining getting vaccinated had a significant positive influence on people's optimism that the vaccine would help them address their health challenge ($\beta = .20$, 95% CI: [.13, .26]) and this greater vaccine optimism in turn had a significant positive influence on their intention to get vaccinated ($\beta = .75$, 95% CI: [.60, .91]).

Third, and importantly, the index of moderated mediation for the serial indirect effect through both vaccine ease of imagining and vaccine optimism was significant (95% CI: [$-.20$, $-.09$]), indicating that the interactive effect of frame condition and interdependence-independence on vaccination intentions was serially mediated by vaccine ease of imagining and vaccine optimism. Namely, the initiator (vs. responder) → vaccine ease of imagining → vaccine optimism → vaccination intentions pathway was significant and negative when interdependence-independence was one standard deviation above the mean ($\beta = -.26$, 95% CI: $-.41$, $-.14$]), but was significant and positive when interdependence-independence was one standard deviation below the mean ($\beta = .34$, 95% CI: [.19, .51]). In other words, for participants who were high in interdependence, adopting a responder (vs. initiator) frame

made them more likely to get the vaccine (and this effect was serially driven by greater ease of imagining getting the vaccine and greater optimism about the vaccine); for participants who were high in independence, adopting an initiator (vs. responder) frame made them more likely to get the vaccine (and this effect was serially driven by greater ease of imagining getting the vaccine and greater optimism about the vaccine). Together, these results confirm the predicted moderated serial mediation.

To provide further support for our conceptual model, we also tested several alternative explanations for our effects: ease of imagining a flood-related illness, processing fluency, processing involvement, general optimism, financial optimism, and global warming optimism. We analyzed each in a separate model using the (continuous) interdependence-independence scores, frame condition (initiator, responder), and the interaction of these two variables as predictors. Across these six analyses, no effects were significant ($Fs < 2.2$, NS). Thus, none of these constructs could account for our observed effects.

In contrast, the same analysis (separately) performed on the vaccine ease of imagining, vaccine optimism, and vaccination intentions variables revealed the predicted significant frame condition by interdependence-independence interaction (vaccine ease of imagining: $F(1, 253) = 50.13$, $p < .001$; vaccine optimism: $F(1, 253) = 63.56$, $p < .001$;

vaccination intentions: $F(1, 253) = 31.91$, $p < .001$). Replicating the results of the moderated serial mediation, spotlight analyses revealed that the simple effect of the initiator (vs. responder) frame manipulation was significant at one standard deviation above the mean of interdependence-independence (vaccine ease of imagining: $\beta = -1.71$, SE $= .40$, $p < .001$; vaccine optimism: $\beta = -1.19$, SE $= .23$, $p < .001$; vaccination intentions: $\beta = -1.21$, SE $= .34$, $p < .001$) and at one standard deviation below the mean of interdependence-independence (vaccine ease of imagining: $\beta = 2.16$, SE $= .39$, $p < .001$; vaccine optimism: $\beta = 1.23$, SE $= .22$, $p < .001$; vaccination intentions: $\beta = 1.43$, SE $= .33$, $p < .001$). No main effects were significant in any of these three analyses ($Fs < 1$, NS).

Study 6 shows that the effects we predict hold for intentions to use a health product, a downstream variable beyond optimism. In the aftermath of regional flooding, affected college students who were high in interdependence were more likely to indicate an intention to get vaccinated if the Immunasil message used responder (vs. initiator) language, whereas those high in independence were more likely to do so if the Immunasil message used initiator (vs. responder) language. This same pattern applied to their feelings of optimism regarding the vaccine and the ease with which they could imagine getting vaccinated to stay healthy. Our moderated serial mediation analysis also revealed that the interactive effect of self-view and frame influences ease of imagining the process of getting the vaccine and, in turn, optimism about the vaccine and intentions to get vaccinated.

GENERAL DISCUSSION

Optimism fuels health and recovery, yet we still know little about how and when people experience greater optimism when confronted with a health challenge. To tackle this question, we ran six studies in the lab and field (with over 1,300 participants) and uncovered significant cultural differences in how optimism was cultivated. In cultures where the interdependent (vs. independent) self is more highly accessible, individuals adopting a responder (vs. initiator) frame when facing a health challenge were more optimistic about their recovery (studies 2, 4, and 6), made decisions that reflected this greater optimism (studies 1, 5, and 6), anticipated feeling greater energy (study 2), and demonstrated stronger physical endurance (study 3). These results held for people facing various health challenges (i.e., cancer, diabetes, flood-related illness, and traumatic injury), both imagined and real, in both single-country and cross-country samples. Further, these results persisted across dependent measures—from self-reported optimism to preferences for remedial health programs, preventative treatments, and vacations to intentions to follow a doctor-recommended diet plan. Importantly, these effects were

driven by the ease with which participants imagined the recovery process, as indicated by both mediation (studies 4 and 6) and moderation (study 5) analyses. Together, these results enrich our theoretical understanding of when and how optimism can be cultivated and highlight optimism's importance to consumer behavior. But also, we forge yet identified connections across seemingly disparate literature domains, including streams addressing cultural patterns in thinking styles (Masuda et al. 2008), fit effects (Avent and Higgins 2003, 2006), and generation of mental imagery (Jiang et al. 2014; Markus and Ruvolo 1989; Taylor et al. 1998).

Our findings also address recent calls to advance consumer welfare (Mick et al. 2012) and to help consumers achieve better health outcomes (Bublitz et al. 2010; Goldberg 2008). Although prior social psychological research has revealed that optimism can benefit physical health (Scheier and Carver 1985; Taylor et al. 1992), research has been largely silent on its effects. Our research lays the groundwork for a roadmap for building optimism in the face of a health challenge, and further adds to the extant well-being literature by offering novel insights into the importance of culture, frames, and mental imagery when encouraging consumers to make helpful health-related judgments and decisions. For instance, by showing how a positive outlook can be best achieved across cultures, our findings provide further evidence challenging the notion that autonomy and independence are indispensable, universal prerequisites for well-being (Markus and Schwartz 2010). It is often assumed that people are at their best—motivated, satisfied with life, healthy—when they have freedom from external forces and influences (e.g., self-determination theory, dissonance theory, reactance theory), but this assumption may be more relevant for some people than others. For Westerners generally, and Americans in particular, autonomy and self-determination are treasured ideals. People from cultures that value an interdependent self-view, however, are subject to a different set of core beliefs and assumptions regarding such needs.

This research also advances our understanding of the emerging literature that shows how a person's state of mind can help achieve positive health outcomes. Though frames are transitory, they can influence vital physiological processes and shape responses to inputs and stimuli people encounter. For example, the stomach's hormonal response to eating can differ depending on whether one adopts an indulgent rather than sensible eating frame (Crum et al. 2011). Relatedly, when people believe that stress is beneficial rather than debilitating, they have more moderate cortisol responses to stressful situations (Crum et al. 2013). Our studies are added evidence that a person's frame during critical periods can have important, potentially life-saving effects on their health. We aim to contribute to this body of work by identifying a particular frame dimension, initiator versus responder, and illuminating how it can

differentially impact both subjectively experienced and physiologically grounded health-related outcomes across cultures.

Further, the current research makes important theoretical contributions to the mental imagery literature by shedding light on why culture moderates the effectiveness of initiator versus responder frames. Although prior research has shown that engaging in process-oriented imagining can be adaptive and beneficial for goal attainment (Hayes-Roth and Hayes-Roth 1979; Markus and Ruvolo 1989; Niemiec et al. 2010; Taylor et al. 1998), prior research diverges with regard to the frame that one should adopt when undertaking such imagining. Whereas some research suggests that people who imagine the future should focus on the individual and her or his own potential (person-focused, initiator frame; Markus and Nurius 1986; Markus and Ruvolo 1989; Niemiec et al. 2010), other research suggests people should focus on the future situations they will face and their responses to these challenges (situation-focused, responder frame; Hayes-Roth and Hayes-Roth 1979; Pham and Taylor 1999; Taylor et al. 1998). Thus, by showing that each of these mental simulation frames can be optimal, depending on the cultural background of the person envisioning the process needed to recover from a health challenge, our research offers insights that could help reconcile these conflicting findings to identify when and why it would be more beneficial to adopt one process-oriented frame over the other.

From a practical perspective, our findings also offer guidance for organizations and individuals—including health care providers and specialists, counselors, policy makers, and health-oriented businesses—who wish to communicate with consumers about health-related matters. As one example, the names and slogans chosen by marketers for health-related products or services (e.g., the iFit Act fitness tracker vs. the ReAct trainer machine) may trigger one frame or the other, and our research suggests that could affect consumers' resulting optimism. The imagery underlying wording and phrases used in communication might also prompt one or the other frame. For instance, when faced with a health challenge we are often urged to "grab the bull by the horns" and "act on our thoughts and instincts," or at other times told to "wait and see what happens" and "be ready to react to whatever comes your way." Similarly, promotional materials for health-related products and services may contain initiator-focused phrases (e.g., "act now" or "your actions") or responder-focused phrases (e.g., "respond now" or "your reactions"). Our work suggests that if one fails to consider a person's cultural background when making these types of recommendations or when designing marketing stimuli, one may inadvertently hinder that person's ability to maximize their optimism.

Finally, the results of our studies point toward paths for future research. One avenue is to examine how different types of mental simulation might moderate the observed effect of ease of imagining on optimism or other important goal-related outcomes. Though our research examines the effects of two process-oriented imagining frames (as such frames are generally adaptive and beneficial for goal attainment; Hayes-Roth and Hayes-Roth 1979; Markus and Ruvolo 1989; Niemiec et al. 2010; Taylor et al. 1998), other types of mental simulation also exist. And prior work has shown that not all types of mental simulation are equally effective for helping people attain their goals and regulate their behavior. Indeed, fantasizing (Kappes et al. 2013; Oettingen 1996), painful ruminations (Horowitz 1976; Silver et al. 1983), and outcome-focused mental simulations (Taylor et al. 1998) have all been shown to interfere with goal pursuit and achievement. Thus, one question that future research could explore is whether greater ease of imagining under these circumstances would instead enhance the maladaptive nature of these forms of mental simulation and, therefore, reduce positive outcomes like optimism.

Optimism has been shown to be a cornerstone of successful recovery in the face of a health challenge (Scheier and Carver 1985; Taylor et al. 1992). However, how to best cultivate that optimism is much less understood, particularly across cultures. The present research aims to positively impact consumer welfare by anchoring on optimism and showing that how people can best cultivate it during a health crisis depends on the degree to which their cultural background encourages them to consider their actions in light of specific situations (vs. their own actions regardless of the situation). Our findings highlight that there is not a single, universal path to achieving optimism, and that one's culture plays an important role in determining which path is likely to be the most effective and fruitful. With this perspective, our work seeks to fuel research streams focused on improving people's lives—in this case, by offering novel insights about how those facing health challenges can most effectively maintain an optimistic, healthy outlook.

DATA COLLECTION INFORMATION

The first and second authors completed the analyses. Study 1 data were collected in September 2016 via the online subject pool MTurk by research assistants at the Stanford GSB Behavioral Lab, under the direction of the second and third authors. Study 2 data were collected in April 2013 by C. Chen and E. Garbinsky, under the supervision of the third author. Study 3 data were collected in October through December 2015 by M. Haupt at the Stanford GSB Behavioral Lab, under the supervision of the third author. Data for study 4 were collected in May 2010 at both the Stanford GSB, under the supervision of the third author, and by K. Lee at the University of Sydney, under

the supervision of the first author. Study 5 data were collected via the online subject pool MTurk in May 2016 by L. Agnew at the Stanford GSB Behavioral Lab, under the supervision of the first and third authors. Study 6 data were collected in October 2016 by research assistants at the University of Houston, under the supervision of the second author.

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