

The Development and Resulting Performance Impact of Positive Psychological Capital

Fred Luthans, James B. Avey, Bruce J. Avolio,
Suzanne J. Peterson

Recently, theory and research have supported psychological capital (PsyCap) as an emerging core construct linked to positive outcomes at the individual and organizational level. However, to date, little attention has been given to PsyCap development through training interventions; nor have there been attempts to determine empirically if such PsyCap development has a causal impact on participants' performance. To fill these gaps we first conducted a pilot test of the PsyCap intervention (PCI) model with a randomized control group design. Next, we conducted a follow-up study with a cross section of practicing managers to determine if following the training guidelines of the PCI caused the participants' performance to improve. Results provide beginning empirical evidence that short training interventions such as PCI not only may be used to develop participants' psychological capital, but can also lead to an improvement in their on-the-job performance. The implications these findings have for human resource development and performance management conclude the article.

A resource-based view of the firm suggests that optimal use of human capital can be a key source of competitive advantage because it is so difficult for competitors to replicate (Barney, 1991). This resource-based view has led to considerable attention in the human resource development (HRD) field focused on evaluating the value and impact of human capital on organizational performance (e.g., Arthur, 1994; Huselid, 1995; Huselid, Becker, & Beatty, 2005). Recently, largely stimulated by the positive psychology movement (e.g., see Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001;

Snyder & Lopez, 2002), there has been a call to go beyond human capital (generally recognized to be the education, experience, and implicit knowledge of human resources) by focusing on what has been termed positive “psychological capital” (Luthans & Youssef, 2004; Luthans, Youssef, & Avolio, 2007). Specifically, this psychological capital or, simply, *PsyCap*, is not only concerned with “who you are” (i.e., human capital) but also, in the developmental sense “who you are becoming”, your “best self” (Luthans, Youssef et al., 2007, p. 20)

In defining what constitutes a psychological capital resource, Luthans (2002a, 2002b) suggested that it be based in theory and research, amendable to valid measurement, statelike and thus open to development and change, and have performance impact. Given these criteria, the resources drawn from positive psychology that were determined to meet these inclusion criteria best were efficacy, hope, optimism, and resilience (Luthans, 2002a, 2002b; Luthans, Youssef, & Avolio, 2007). Stajkovic (2006) also has advanced the same four constructs in his proposed motivational model called “core confidence,” confirming the inclusion of these four components by Luthans and his colleagues.

The formal definition of psychological capital is “an individual’s positive psychological state of development that is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success” (Luthans, Youssef, & Avolio, 2007, p. 3).

To date, research supports that the four component resources load on the higher-order core construct of psychological capital and indicates convergent and discriminant validity with similar positive core constructs such as core self-evaluations and relevant personality traits such as conscientiousness (Avey, Luthans, & Jensen, 2009; Luthans, Avolio, Avey, & Norman, 2007). There is also growing evidence that *PsyCap* is significantly related to desired employee behaviors (and negatively to undesired behaviors), attitudes (e.g., satisfaction and commitment), and performance (e.g., see Avey, Luthans, & Youssef, in press; Luthans, Avolio et al., 2007). Furthermore, recent research indicates that *PsyCap* has implications for combating stress (Avey, Luthans, & Youssef, in press), may help in facilitating positive organizational change (Avey, Wernsing, & Luthans, 2008), and mediates the relationship between supportive organizational climate and employee performance (Luthans, Norman, Avolio, & Avey, 2008).

Besides this expanding research demonstrating the positive relationship that *PsyCap* has with desired employee outcomes, there is also conceptual (Luthans, Avey, Avolio, Norman, & Combs, 2006; Luthans, Youssef, & Avolio, 2007) and beginning empirical evidence (Luthans, Avey, & Patera, 2008)

that PsyCap can be developed. To date, a PsyCap Intervention (PCI) training model has been developed (Luthans, Avey et al., 2006) and has been preliminarily tested in an on-line exercise (Luthans, Avey, & Patera, 2008). However, additional research is needed to both test further whether PsyCap can be developed via the PCI training model, as well as to determine its impact on individual performance.

To accomplish these goals we employed a pilot study with a student sample whereby subjects' level of PsyCap development from the PCI training program was assessed by a pretest, posttest control-group experimental design. Second, we conducted a follow-up study with the use of a sample of practicing managers to assess the impact of the PCI training on the managers' PsyCap and performance. Before providing the theoretical foundation behind our research, we feel it is important to discuss first the trait–state distinction that is so critical to the developmental premise of PsyCap and the training intervention tested in this research.

“Statelike” and “Traitlike” Characteristics

Through the years in psychology, there has been considerable debate and discussion about the state versus trait distinction (e.g., see Allen & Potkey, 1981). Although states and traits are often treated as independent, dichotomous constructs, we build on earlier work suggesting that they likely fall along a continuum that at the trait end are not easily developed to the state end, which is much more developable (Luthans, Avey et al., 2006; Luthans & Youssef, 2007; also see Chen, Gully, Whiteman, & Kilcullen, 2000). Specifically, we propose the positions along a state–trait continuum would be as follows.

1. At one extreme would be relatively pure states, which are momentary and very changeable, representing feelings (e.g., pleasure, moods, and happiness).
2. Next would come statelike constructs, which are more malleable and open to development, representing the positive psychological resources found in PsyCap (e.g., efficacy, hope, resilience, and optimism).
3. Then moving along the continuum would be traitlike constructs, which are more fixed and difficult to change, representing personalities and strengths (e.g., Big Five personality dimensions, core self-evaluations, and character strengths and virtues).
4. Then would be the other extreme of relatively pure traits, which are very fixed and very difficult to change (e.g., intelligence, talents, and heritable characteristics).

In other words, the positive resources that make up an individual's psychological capital are conceptually proposed to fall in between pure states

and traitlike constructs. That is, PsyCap resources are conceptualized to be more stable than states such as moods or emotions, but not as fixed as personality traits such as conscientiousness or core self-evaluations.

Preliminary empirical evidence supports this statelike and traitlike distinction. Specifically, after correcting for internal consistency reliability, the corrected test–retest reliabilities show that conscientiousness (0.76) and core self evaluations (0.87) measures both had relatively high stability versus the psychological capital scale (0.52) and the positive emotions measure (0.46) (see Luthans, Avolio et al., 2007). Thus, there is beginning empirical evidence that PsyCap falls in the statelike position on the proposed continuum. This knowledge, combined with findings suggesting that psychological capital is developable through an on-line training exercise (see Luthans, Avey, & Patera, 2008), serves as a basis for proposing that the PsyCap resources of hope, optimism, efficacy, and resilience are open to change and development.

Theoretical Foundation of Psychological Capital. Right around the turn of the last century (e.g., see Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001; Snyder & Lopez, 2002), the field of psychology began to place greater emphasis on examining what was right with people and what contributes to human flourishing and growth potential. The positive focus and approach that was emerging primarily in the area of clinical psychology was then extended to the workplace by focusing on both the value of micro-oriented positivity in individuals (Luthans, 2002a, 2002b; Luthans, Youssef, & Avolio, 2007; Nelson & Cooper, 2007; Wright, 2003), as well as more macro-oriented positivity in organizations and communities (Cameron & Caza, 2004; Cameron, Dutton, & Quinn, 2003; Roberts, 2006; Spreitzer & Sonenshein, 2004).

What distinguished the PsyCap constructs from other positive constructs that already existed in the organizational and personal development popular literature was the focus on theory, research, and valid measurement. In addition, the statelike and open-to-development criterion served to differentiate PsyCap constructs from traitlike constructs such as core self-evaluations, positive affectivity, and “Big Five” personality characteristics, among others. Each of the PsyCap constructs is described in more detail below.

The Hope Resource in PsyCap. The construct of hope in positive psychology has considerable theoretical development, research support, and is generally considered to be an “empowering way of thinking” (Snyder, 1994, p. 2). In formulating his hope theory, Snyder began with the assumption that people are generally goal oriented; that is, people behave in such a way that they are trying to accomplish something. Snyder determined there were two components comprising hope: agency (willpower) and pathways (Snyder, 2000; Snyder, Rand, & Sigmon, 2002).

Agency represents an individual’s capacity or motivation to both start work on a given goal and to continue down the path of accomplishing that goal. Although motivation to accomplish given goals is important at all points in goal pursuit, it becomes especially critical in times where impediments or

goal blockages arise (Snyder, 2000). The agentic capacity of hope within individuals can be heard when people express “positive self talk” comments such as “I can do this” or “I will not be stopped” (Snyder, Lapointe, Crowson, & Early, 1998).

If agency is the willpower required to execute a given route to goal accomplishment effectively, pathways thinking in Snyder’s (1994, 2000, 2002) hope theory is the ability to generate those necessary routes. A high-hope individual is one who proactively generates one or more pathways to goal accomplishment in a given situation. When those with advanced pathways thinking are executing a given pathway (e.g., progressing toward a project goal) and it becomes blocked (e.g., a technical breakdown), they show the capacity to launch into predetermined alternative pathways to continue toward goal accomplishment.

In addition to demonstrated positive impact on athletic, academic, health outcomes, and psychological adjustment in clinical applications, hope has also been found to lead to higher work performance outcomes across a number of independent studies (Luthans, Avolio et al., 2007; Luthans, Avolio, Walumbwa, & Li, 2005; S. J. Peterson & Byron, 2007; S. J. Peterson & Luthans, 2003; Youssef & Luthans, 2007). The mechanism of agency appears to support organizational participants to be more motivated toward accomplishing work-related goals, which in turn positively affects their performance. In addition, pathway thinking provides managers and their employees with the capacity to generate multiple ways to attain a given goal (e.g., contingency plans), especially where some pathways become blocked. Relevant to the main focus of the current study, Snyder (2000) and Snyder et al. (2002) have clearly demonstrated state hope as being developable across multiple clinical studies with the use of a goals-based framework. These guidelines for hope development have also been applied to human resource development (Luthans & Jensen, 2002). Thus, we propose that hope as defined here can be developed through a short training intervention process in the workplace.

The Optimism Resource in PsyCap. Carver and Scheier (2002, p. 231) note “optimists are people who expect good things to happen to them; pessimists are people who expect bad things to happen to them” and the difference between the two is not trivial, as optimists “differ in how they approach problems and challenges and differ in the manner and success with which they cope with adversity.” There are two major complementary theoretical streams by which optimism is explained in positive psychology. Seligman (1998) uses an attribution framework (i.e., explanatory style) whereby optimists make internal, stable, and global causal attributions of positive events and external, unstable, and specific attributions of negative events. Carver and Scheier (2002), on the other hand, take an expectancy perspective for their theoretical framework. A primary mechanism constituting this optimistic process is the expectation that a desirable outcome will result from increased

effort. Carver and Scheier (2002) note that when people have this positive expectancy, they will continue to put forth effort even in the face of increasing adversity. By contrast, pessimists often lack the positive expectation of a desirable outcome to even initiate an action toward arriving at the desired outcome. Thus, it follows that increased effort would generally lead optimists to perform better than pessimists.

Although optimism has been portrayed as dispositional in the early work of Scheier and Carver (1985), Seligman (1998) later suggested that it can be developed, which he termed “learned optimism.” Indeed, in support of Seligman’s arguments, Carver and Scheier (2002, p. 240) more recently have concluded, “change in an optimistic direction is possible” through developmental interventions. Thus, although individuals may be more or less optimistic, there is potential to develop optimism, which provides theoretical support for being a positive statelike capacity that can be enhanced through intervention.

The Efficacy Resource of PsyCap. Efficacy is the positive psychological construct that perhaps has the most extensive theory and research support (e.g., Bandura, 1997, 2005, 2008). Multiple meta-analyses have concluded that self-efficacy has considerable impact on performance outcomes (Sadri & Robertson, 1993; Stajkovic & Luthans, 1998a). With roots in Bandura’s (1997) social cognitive theory, applied to the workplace, efficacy has been defined as “the individual’s conviction or confidence about his or her abilities to mobilize the motivation, cognitive resources or courses of action needed to successfully execute a specific task within a given context” (Stajkovic & Luthans, 1998b, p. 66).

Efficacy differs from the other positive psychological constructs in important ways. For example, efficacy is a belief within the boundaries of a specific task and/or context, whereas optimism is a general expectation of positive outcomes. Also, efficacy is a perception or belief about the process and results of applying one’s personal abilities, whereas optimism is a positive expectation about outcomes that is less connected to one’s personal ability. Organizational participants can be efficacious about a particular aspect or task within their job or work context and still be pessimistic, expecting to be laid off or fired eventually, regardless of their abilities. Likewise, employees may have low efficacy about their abilities in a particular task or context for their job. Yet these same employees may still be optimistic that they will ultimately be successful on the job and/or in other domains of life.

Bandura (1997) has identified four widely recognized sources of efficacy development. First, when individuals successfully accomplish a challenging task, they are generally more confident in their abilities to accomplish the task again. This task mastery enables personal efficacy over that specific task. Second, personal efficacy is influenced when individuals vicariously learn by observing (i.e., modeling) relevant others accomplish a given task. If a relevant other is successful at a given task, personal efficacy to follow suit is

increased. The impact of such modeling is dependent on how similar the individual sees him- or herself with regard to the role model who successfully accomplished the task. The more similar/relevant the role model, the more effective the efficacy development process becomes (Bandura, 1997).

Third, individuals can be persuaded by respected and/or relevant others to be more confident. A simple example would be a respected leader informing one of his or her employees that she believes this associate has the capability to accomplish a given task. This, coupled with providing feedback to the employee that progress is being made, would both be expected to build the efficacy of the associate. The effectiveness of this method of building efficacy is dependent on the degree to which the persuader has credibility with the recipient (Bandura, 1997).

Finally, psychological, physiological, or emotional arousal and/or wellness may influence levels of personal efficacy. A classic example is the organizational leader who provides caring emotional support and appreciation to employees to prevent burnout and to help keep employees mentally and physically fit. This process and development from these four sources helps to explain the significant impact that efficacy has on performance outcomes in the workplace (Stajkovic & Luthans, 1998a).

The Resilience Resource of PsyCap. Resilience “refers to a class of phenomena characterized by patterns of positive adaptation in the context of significant adversity or risk,” which enables individuals to bounce back quickly and effectively from adverse events (Masten & Reed, 2002, p. 75). Resilience is the difference between those who recover well after adversity and those who remain devastated and unable to move ahead (Block & Kremen, 1996; Masten et al., 1985). Richardson (2002) argues that those higher in resilience bounce back psychologically (including emotion and cognition) to levels at, or even beyond, previous levels of homeostasis or equilibrium (also see Bonanno, 2004).

Much of the research on resilience has stemmed from clinical psychology where therapists focus interventions on one’s levels of both assets and risk factors (Masten, 2001). Personal assets are those measurable characteristics that predict positive outcomes and adaptation to adverse circumstances. These assets are often referred to as resources, and in the workplace may take the form of a promotion or mentorship program (Masten & Reed, 2002). By contrast, risk factors are those measurable characteristics that predict negative outcomes and poor adaptation and in the workplace may be threats such as an abusive supervisor or losing a big customer account. Developing assets and minimizing risk factors are the targets of resilience development interventions (Masten, 2001).

Considering that resilience is developable, Werner and Smith (1982, 1992), in what has been called “the most important longitudinal study of resilience to date” (Masten & Reed, 2002, p. 80), found that resilience does in fact change over time. Considerable work in clinical and positive psychology

(e.g., see Bonanno, 2005; Garmenzy, 1974), as well as human resource development (Luthans, Vogelgesang, & Lester, 2006), supports the notion that resilience can be developed through training interventions and lends support for the statelike nature of this important positive resource in today's turbulent environment.

Linking the Theoretical and Empirical Support for Integrative Development.

As noted above, there is both conceptual and empirical (e.g., see Bryant & Cvenegros, 2004; Carifio & Rhodes, 2002; Magaletta & Oliver, 1999) support that the four positive psychological resources of hope, optimism, efficacy, and resilience have discriminant validity. Moreover, as indicated, these four in combination have been conceptually (Luthans, Youssef, & Avolio, 2007) and empirically (see Luthans, Avolio et al., 2007) demonstrated to form a second order, core construct.

Conceptually, the definition of PsyCap in the introductory comments suggests an integrative, common link running among the four dimensions is a motivational propensity to accomplish goals and succeed. Specifically, Bandura's (2008) agentic perspective on positive psychology would suggest that the four positive resources interact in a synergistic manner such that an individual is at his or her operational best when one resource is informing the other.

An example for helping explain this agentic interactive relationship among the four constructs can be found in Bandura's (1997) distinction between efficacy and resilient efficacy, whereby resilient efficacy intentionally (agentially) perseveres in spite of setbacks. Another example would be the hopeful employee who encounters a setback to goal accomplishment, but intentionally and proactively rebounds quickly to pursue an alternative pathway because he or she has high levels of optimism, efficacy, and resilience. As Bandura (2008, p. 167) declares, "Unless people believe they can produce desired effects by their actions they have little incentive to act or to persevere in the face of difficulties." This belief to act intentionally comes from their reservoir of PsyCap, which in turn serves as the foundation for their motivation and striving to attain goals and succeed.

Allied support for the core construct of PsyCap can also be found in the psychological resource theories (see Hobfoll, 2002). These theories posit that psychological resources (e.g., efficacy, hope, optimism, and resilience) can be best understood and treated as manifestations of a larger underlying phenomenon. Similar support comes from Fredrickson's (1998, 2001) broaden-and-build theory of positivity. She and others (e.g., Isen, 1987) have found that positive emotional states can strengthen not only intellectual, physical, and social resources, but also one's combined psychological resources. Taken together, the four resources synergistically interacting to form the core construct of PsyCap can be expected to lead to higher performance based on their reinforcing greater extra effort from individuals, promoting the generation of multiple solutions to problems, positive expectations about results leading to higher levels of motivation, and positive responses to setbacks.

In other words, there may be a motivational propensity found in PsyCap for goal accomplishment and success.

Luthans, Avolio et al. (2007) have provided direct empirical support for PsyCap as a core construct. Specifically, they found that each of the four dimensions best load onto the psychological capital core factor. In addition, a recent study provided further support for the core construct by empirically demonstrating that PsyCap predicted unique variance in a number of attitudes and behaviors of a large sample of employees beyond their demographics, core self-evaluation, personality traits, and person–organization and person–job fit (Avey, Luthans, & Youssef, in press).

In sum, there is considerable support for PsyCap as a core construct and its relationship to attitudes, behaviors, and performance. Now the time has come to test the developmental nature of PsyCap. As indicated in the stated purposes of this research, we will for the first time experimentally test the development and possible causal performance impact of the core construct of PsyCap with the use of a face-to-face short-term training intervention strategy proposed by Luthans, Avey et al. (2006). The primary research question that drove this study is the following: *Can the four positive constructs of hope, optimism, efficacy, and resilience, in combination as a core construct representing psychological capital, be developed in a short training intervention for positive impact on the participants' performance back on the job?*

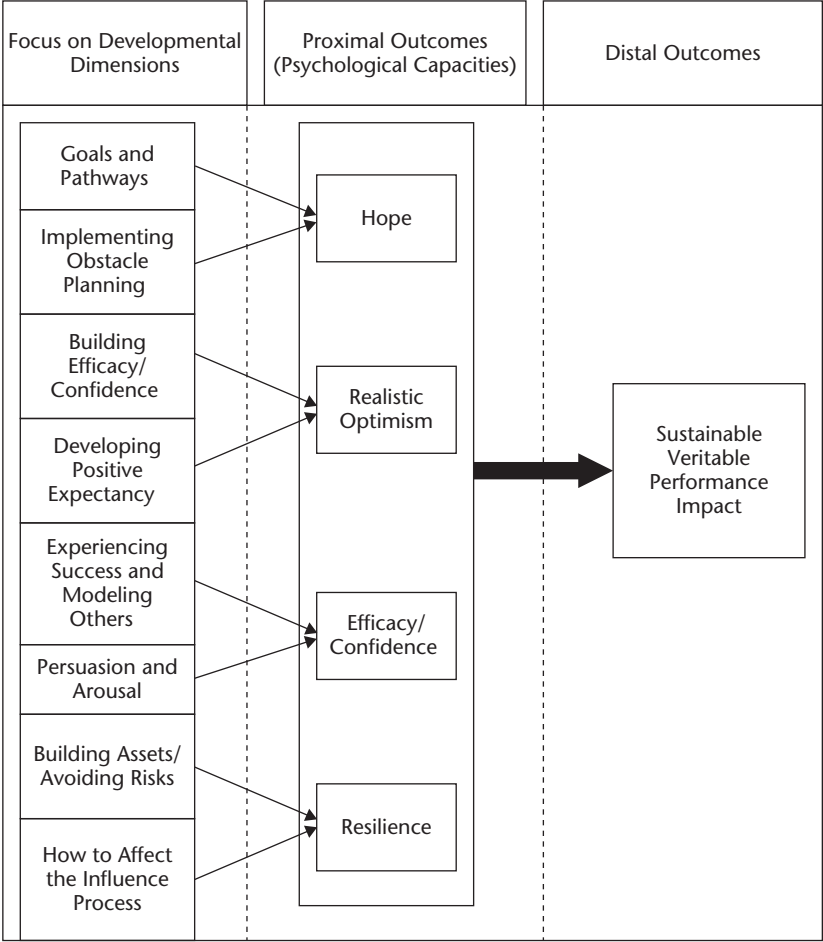
Methods

Pilot Study Procedures. We used a highly controlled pilot study in order to determine first the viability of a recently proposed (see Luthans, Avey et al., 2006; Luthans, Youssef, & Avolio, 2007, Chapter 8) training intervention model (described in detail below) for impacting the four constructs and the combined core factor of psychological capital. This pilot utilized a sample of 242 advanced management students from a large midwestern university. The focus and examples used in the training intervention were slightly adapted to be relevant to this sample. A little over half (58%) of this sample were male and their average age was 21.1 ($SD = 2.66$). These participants were told they would be participating in leadership training. Importantly, the participants were randomly assigned to treatment ($N = 153$) or control ($N = 89$) groups.

The treatment groups received a 2-hour training intervention conducted by training facilitators that utilized a series of exercises and group discussions designed to impact the participants' level of efficacy, hope, optimism, and resilience, individually and overall in terms of their PsyCap. The psychological capital intervention (PCI) model for this training is depicted in Figure 1, and a brief summary of the specific content is found in the Appendix (a narrative of how this model was actually implemented is also in the following sections).

Within the 2-hour intervention we counterbalanced the order of exercises in the treatment groups. All materials and exercises (except for the

Figure 1. Positive Psychological Capital Intervention



Note: This intervention is intended to affect each state as well as the overall level of psychological capital for performance impact.

Source: Adapted from Luthans, Avey et al., 2006 and also found in Luthans et al., 2007

ordering) were the same for all treatment groups. Specifically, one set of participants received the intervention first targeting hope and efficacy, followed by resilience and optimism. The alternative order included first receiving the intervention focused on resilience and optimism followed by hope and efficacy. Analysis of variance revealed no significant mean difference in participants' level of psychological capital between the ordering conditions in both pre- and posttests. Those randomly assigned to the control groups were

given a different (i.e., next best) intervention that focused on group decision making (not the four positive constructs), and included similar duration and exercise format to maintain as much equivalence of the treatment and control conditions as possible.

Main Study Procedures. After the pilot study was completed and assessed, the main study consisted of a heterogeneous group of managers ($N = 80$) sampled across a wide variety of organizations in a medium-sized midwestern city. Volunteers were recruited by the university to participate in a public service “leadership training workshop” (i.e., the same 2-hour intervention as depicted in Figure 1 and the Appendix used in the pilot phase, but with slightly different, more relevant examples for this sample of practicing managers). All the participants received the 2-hour training intervention at the same time in the same facility. This sample had an average age of 36 years with, on average, a little over a dozen years of full-time work experience. The population was 54% male and predominantly white (76%; 4% were African American, 9% Asian, 7% Hispanic, and 1% Native American).

The Intervention Training Implementation. As indicated above, the content of the psychological capital training intervention utilized in both the pilot and main study is summarized in Figure 1 and the Appendix and is drawn from Luthans and colleagues (Luthans, Avey et al., 2006; Luthans, Youssef, & Avolio, 2007, Chapter 8). The goals in implementing this psychological capital intervention (PCI) were (a) short duration to minimize disruption in the work process, (b) designed to influence each of the four positive psychological dimensions, and (c) designed to influence the overall positive psychological core construct through an integration of the underlying principles and developmental dimensions of each of the four individual PsyCap resources. Our purpose of the focused short duration followed the models of Locke, Shaw, Saari, and Latham (1981) and Luthans and Kreitner (1985), who have demonstrated successful similar short-term goal setting and reinforcement interventions to improve performance (Stajkovic & Luthans, 1997, 2001).

The intervention training implementation included two stages. First, we used a series of exercises specific to each of the four constructs to impact development (see Appendix). Next, we utilized similar, but more integrative, writing, discussion, and reflective exercises. The purpose of this second phase of the training was to integrate the development of the individual facets into an understanding and operationalization of the overall positive psychological construct.

Examples of the exercises used in both developing the individual dimensions and then integrating them into the overall PsyCap included one that focused on broadening the hope-oriented agentic capacity and pathways thinking toward a specific goal. First, each participant was asked to consider and then write down a personal goal or goals. Drawing from Snyder's (2000) hope theory and specific guidelines from hope development used in clinical applications, the facilitator (one of the researchers) led participants through

a series of techniques to set and phrase goals to increase agentic capacity (Bandura, 2008). This included parceling large goals into manageable units (called “stepping” in hope development; see Snyder, 2000), thereby also increasing efficacy over smaller subgoals.

Next, participants were guided into considering multiple pathways to accomplishing each goal and to share (i.e., model for others) those routes in small discussion groups within the intervention session. These small-group discussions then led to additional pathways to accomplishing the goal. Thus, the capacity for pathway generation was expected to be increased through vicarious learning and in turn to enhance participants’ level of efficacy in utilizing the hope application of deriving multiple pathways to accomplish a given goal. In addition, by increasing their efficacy to accomplish the goal, the participants were expected to increase their positive expectations of goal accomplishment and thus their levels of optimism.

Next, through the development of several pathways to accomplish the goal, levels of resilience were expected to increase given that multiple pathways allow individuals to bounce back to being successful by selecting an alternate pathway when the original pathway becomes blocked. In other words, part of resilience is bouncing back after a setback. These setbacks can be when a goal is not reached and the pathway to that goal becomes blocked. By increasing the ability and efficacy to develop multiple pathways, individuals may choose an alternate pathway when the current one is blocked, getting them proactively re-energized to succeed.

Given the assumption in optimism development that people tend to make unrealistically negative distortions, which in turn generate negative affective thought processes and behavior, the perspective behind the intervention training included making participants more aware of their thoughts and identifying them as negative. Once identified, these negative thoughts can be isolated and challenged by the participant and by others in the discussion groups. The goal of this technique was to make beliefs or expectations about the future more realistically optimistic. As shown in Figure 1, PCI, and content summarized in the Appendix, such developmental inputs are drawn from each of the four constructs and then integrated as described above during this 2-hour training intervention.

In conclusion, the PCI implementation was designed to increase levels of each of the four resources and, importantly, the overall PsyCap of the training participants. The PCI guidelines draw from extant research on each capacity grounded in clinical psychology (hope, resilience), attribution and expectancy theories (optimism) and Bandura’s (1997) work in efficacy and its corresponding sources of development (Bandura, 1997, 2000). In the training intervention for both the pilot and main study we applied these training principles and guidelines of development from each respective dimension/construct and overall PsyCap. The training intervention leveraged techniques from both theoretical bases (e.g., Bandura, 1997; Carver & Scheier, 2002;

Masten & Reed, 2002; Snyder, 2000) and more practical implementation guidelines (e.g., Bandura, 2000; Coutu, 2002; Seligman, 1998; Snyder, 1994; Stajkovic & Luthans, 1998b).

Unit of Analysis, Measures, and Analysis Techniques. A recent review by Yammarino, Dionne, Chun, and Dansereau (2005) found that less than 30% of leadership studies explicitly stated levels of analysis and measurement, which is considered the starting point for any theory and research effort (Klein, Dansereau, & Hall, 1994). Thus, we want to point out that the present study measured and analyzed the positive constructs and PsyCap at the individual level of analysis. However, the individual-level focus used here does not preclude for the future focusing on dyadic, group, or organizational levels of analysis for measuring and enhancing positive psychological capital (e.g., Youssef & Luthans, 2005). In addition, the performance outcomes were also measured and analyzed at the individual level of analysis.

Measurement of PsyCap. In both phases of this research, PsyCap was measured with the use of the 24-item psychological capital questionnaire (PCQ) found in its entirety in Luthans, Youssef, and Avolio (2007) and empirically validated by Luthans, Avolio et al. (2007). Permission to use the PCQ is available to researchers free of charge at www.mindgarden.com. This instrument was administered twice within 3 days before and 3 days after the training intervention in both the pilot and main study.

The 24 items that make up the survey were adapted from previously published scales that have been analyzed and supported in the positive psychology literature across multiple studies and have been used in previous workplace studies by themselves and in combination (e.g., see Avey, Luthans & Youssef, in press; Luthans, Avolio et al., 2007; Luthans et al., 2005; Luthans, Norman et al., 2008; Youssef & Luthans, 2007). Specifically, the instrument consists of six items adapted from each of the following scales: (a) hope (Snyder et al., 1996); (b) resilience (Wagnild & Young, 1993); (c) optimism (Scheier & Carver, 1985); and (d) efficacy (Parker, 1998). Sample items from each of the subscales included: "I feel confident helping to set targets/goals in my area of work" (efficacy); "If I should find myself in a jam at work, I could think of many ways to get out of it" (hope); "I always look on the bright side of things regarding my job" (optimism); and "I usually manage difficulties one way or another at work" (resilience). Responses were given on a 6-point Likert-type scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *somewhat agree*, 5 = *agree*, and 6 = *strongly agree*.

All the subscales in this study demonstrated reliability alphas greater than 0.70 with the exception of resilience in the student sample of the pilot ($\alpha = 0.69$). However, resilience did demonstrate alpha above 0.70 in the practicing managers' sample. In addition, the overall 24-item composite PCQ demonstrated reliability alphas greater than 0.90 in both samples. Because this is a relatively new scale, we conducted a confirmatory factor analysis (CFA) with the two samples to determine whether we could replicate validation

results reported previously by Luthans, Avolio et al. (2007). This CFA used the maximum-likelihood procedure on the pilot sample and the heterogeneous sample of managers.

The higher-order model we tested had six items loading on each latent factor (i.e., hope, resilience, optimism, and efficacy), as well as the four latent factors loading on an overall higher order, core factor. All of the item loadings were significant ($p < 0.01$) on their respective latent factor. Results for the pilot sample were standardized root-mean-square residual (SRMR) = 0.051, RMSEA = 0.051, comparative fit index (CFI) = 0.937. With the use of the Hu and Bentler (1999) combinatorial rule that two of three indices should fit the recommendation of $SRMR \leq 0.08$, $RMSEA \leq 0.06$, and $CFI \leq 0.95$, results from this sample suggest moderate fit for the higher-order factor model. Results for the practicing managers' sample were SRMR = 0.046, RMSEA = 0.044, CFI = 0.950, providing evidence for a strong model fit based on all three indices. Thus, supporting previous research (Luthans, Avolio et al., 2007), findings from both the pilot and main study samples in this study provide support that the four positive constructs represent an underlying latent core positive psychological factor (PsyCap).

We next compared the proposed higher-order model of each capacity loading to the higher-order factor with four competing models, including three models that combined various dimensions as well as a single-factor model in which all items loaded to one factor. Results shown in Table 1 indicate the higher-order factor model fit the observed data better than the competing models across both samples. Results from this model comparison provide support for the higher order and replicate results of the previous study (Luthans, Avolio et al., 2007).

Performance Measures. Performance measures were not collected for the pilot sample, as the previously noted purpose was to determine under highly controlled conditions the viability of the PCI model for developing PsyCap utilizing random assignment to treatment and control groups. The sample for the main study consisting of the cross-section of managers in a wide variety of organizations used a multisource rating of performance. Specifically, in this sample we administered a self-rated four-item performance measure with a 1–10 rating scale (e.g., “How would you rate your performance/effectiveness as compared with your peers?”) to participants within 1 week before and a week after the intervention. Importantly, however, in addition the participants' managers also rated their performance a week before and a week after the training intervention with the use of the same performance scale reworded for managers rating the target participant. Separate analyses were run for both self- and their manager-rated performance. Participants' managers were told the purpose for their confidential ratings of the trainees' on-the-job performance was part of a university-related research project. However, in order to help minimize rater bias effects, the participants' managers were not directly told that these individuals were involved in a developmental training intervention.

Table 1. Comparison of A Priori Psychological Capital Factor Structure

Models	Factors	Pilot Study					Practicing Managers' Study						
		χ^2	df	$\Delta\chi^2$	RMSEA	CFI	SRMR	χ^2	df	$\Delta\chi^2$	RMSEA	CFI	SRMR
Baseline Model 1	Four factors as indicators of PsyCap (HO; EF; OP; RE)	366.63	224		0.051	0.937	0.051	321.38	224		0.044	0.950	0.046
Model 2	Three factors as indicators of PsyCap (HO and RE merged; EF; OP)	385.96	225	19.33*	0.054	0.929	0.051	341.19	225	19.81*	0.048	0.940	0.048
Model 3	Three factors as indicators of PsyCap (HO and OP merged; EF; RE)	395.53	225	28.90*	0.055	0.924	0.052	333.67	225	12.29*	0.047	0.944	0.047
Model 4	Three factors as indicators of PsyCap (OP and RE merged; EF; HO)	409.16	225	42.53*	0.058	0.918	0.053	351.96	225	30.58*	0.051	0.935	0.049
Model 5	One factor as an indicator of PsyCap (all 24 items)	448.28	228	81.65*	0.063	0.902	0.057	401.88	228	80.50*	0.059	0.910	0.056

Note: PsyCap = psychological capital, HO = hope, EF = self-efficacy, OP = optimism, RE = resilience, CFI = comparative fit index, SRMR = standardized root-mean-square residual.

*Significant at $p < 0.01$.

Table 2. Paired-Sample *t* Tests for All Study Variables

Variable	Mean T1	Mean T2	<i>t</i> -Value	<i>p</i> -Value
Pilot study—treatment				
PsyCap	4.61	4.81	5.16	0.001
Pilot study—control				
PsyCap	4.63	4.65	0.54	0.589
Manager study—treatment				
PsyCap	4.79	4.93	2.99	0.004
Self-rated performance	7.43	8.41	9.14	0.001
Manager-rated performance	7.66	8.20	2.34	0.025

Note: PsyCap = psychological capital.

Analysis Techniques. We conducted paired-sample *t*-tests for both the pilot and manager samples. This analysis was deemed appropriate given the focus on mean differences at two points in time (pre- and postintervention). In addition, we also calculated confidence intervals, effect sizes, and binomial effect-size displays.

Results

As shown in Table 2, the pilot-sample participants in the treatment group significantly reported their psychological capital from Time 1 to Time 2 as being higher (Time 1 *M* = 4.61 and Time 2 *M* = 4.81, *t*[152] = 5.16, *p* < 0.001). The randomly assigned comparison-group participants who underwent a different group decision-making intervention demonstrated no significant increase in their reported PsyCap scores (Time 1 *M* = 4.63 and Time 2 *M* = 4.65, *t* = 0.54, *p* = 0.59). Given that the pilot sample included a randomly assigned control group, we also conducted a more rigorous test of the mean differences by running an ANCOVA, which compared the mean differences for the treatment and control groups at Time 2 while controlling for the PsyCap values at Time 1. This ANCOVA predicts the extent to which the Time 2 PsyCap values were uniquely due to the treatment above and beyond the initial (Time 1) values. In a general linear model, the Time 1 values were entered as a covariate, and the dummy-coded group variable (treatment or control) was entered as a fixed factor predicting level of PsyCap at Time 2. Results as shown in Table 3 indicate that the dummy-coded treatment group variable was a significant predictor of the PsyCap values at Time 2 while controlling for values at Time 1 (*F* = 11.41, *p* < 0.01), suggesting the effect of the treatment influenced values at Time 2 above and beyond values at Time 1.

The sample of managers who underwent the training intervention in the main study had significantly higher levels of PsyCap (Time 1 *M* = 4.79 and Time 2 *M* = 4.93, *t* = 2.99, *p* < 0.01) following the training intervention.

Table 3. ANCOVA Controlling for Psychological Capital at Time 1

Variables	F-Value	p-Value
PsyCap at Time 1	176.08	0.000
Randomly assigned group (treatment or control)	11.41	0.001

Table 4. Effect Sizes and Confidence Intervals

	Effect Size		95% Confidence Interval
	d	r	
Pilot PsyCap treatment	0.40	0.20	±0.074 (0.115–0.264)
Pilot control	0.04	0.02	±0.067 (– 0.048–0.087)
Manager PsyCap treatment	0.31	0.15	±0.092 (0.042–0.227)
Manager self-rated performance	0.96	0.43	±0.211 (0.763–1.186)
Direct manager-rated performance	0.35	0.17	±0.452 (0.097–1.001)

In addition, both self-rated performance (Time 1 $M = 7.43$ and Time 2 $M = 8.41$, $t = 9.14$, $p < 0.01$) and manager-rated performance (Time 1 $M = 7.66$ and Time 2 $M = 8.20$, $t = 2.34$, $p < 0.05$) also significantly increased pre- and posttraining intervention.

In addition to paired-sample t -tests and given the importance of not relying exclusively on tests of significance when interpreting results, Table 4 includes effect sizes r and d . In addition, this table also indicates the 95% confidence intervals for the composite scale score and performance outcomes. It should be noted the only intervals including zero were for the control groups.

Finally, as a secondary analysis, simply to replicate previous research, we also calculated bivariate correlations between PsyCap and performance. Results indicated that the cross section of managers' reported levels of PsyCap were significantly related to their performance. Specifically, the correlations between PsyCap and the managers self-rated performance at Time 1 (preintervention) was $r = 0.61$, $p < 0.01$ and at Time 2 (postintervention) was $r = 0.62$, $p < 0.01$ and for their managers' rating of performance the correlations were $r = 0.20$, $p < 0.05$ at Time 1 and $r = 0.23$, $p < 0.05$ at Time 2.

Discussion

The twofold purpose of this study was first to refine the psychological capital intervention (PCI) model under highly controlled experimental conditions and then to analyze whether PsyCap development led to performance

improvement. Both the pilot and main study supported the PCI as being able to develop PsyCap and the main study provided at least beginning evidence in answering the main research question. That is, the higher-order core factor of psychological capital does seem to be developable in a relatively short training intervention and seems to have a positive impact on the participants' on-the-job performance. Specifically, in the first phase of the pilot study, the randomly assigned management-student participants who received the training intervention significantly increased their reported level of psychological capital. On the other hand, those who were randomly assigned to the comparison group and underwent a different but relevant group-decision intervention did not exhibit any change in their reported psychological capital. The follow-up study using a cross-section of managers in a wide variety of organizations underwent the same training intervention and significantly increased both their level of reported psychological capital and their performance. Importantly, this field sample used multisource measures of performance.

Again, although further research is needed, we feel this research provides preliminary evidence of the value of the higher-order, core construct of psychological capital. Drawing from previous empirical research (Luthans, Avolio et al., 2007), confirmatory model comparison in the results of this research indicated the data best fit a higher-order factor model with each positive construct loading on to the higher-order factor as suggested by Luthans, Avolio et al. (2007). In addition, the results of this current research indicate further empirical verification/replication of the relationship between PsyCap and performance and of the statelike nature of psychological capital. Specifically, with regard to the statelike criterion, the results of this research suggests PsyCap does seem open to development and for the first time provides empirical evidence that such PsyCap development has a significant positive impact on PCI-trained participants' rated work performance.

Although the experimental design, use of control or matched comparison groups, two samples, evidence for reliable and valid measurement, and multiple sources of performance at two points in time contribute to the strength of the study, there are also some potential limitations that need to be recognized. First, although we were able to randomly assign individuals to treatment or control conditions in the pilot study, we were not able to use random assignment to experimental versus control groups in the follow-up using practicing managers. Thus, the latter participants' motivation to develop could certainly contribute to the results obtained; e.g., those who are developmentally ready self-selected to participate in the training.

Second, although this research replicated the use of the PCI guidelines in developing PsyCap for on-line participants (Luthans, Avey, & Patera, 2008), face-to-face training as used in this research needs further refinement. The same is true of previous supporting psychometric evidence for the PCQ measures comprising of subscales of hope, optimism, resilience, and efficacy

(see Luthans, Avolio et al., 2007). Clearly, more research is still needed to contribute to the nomological network representing the construct validity of PsyCap. It is also important to note the strategy that Luthans, Youssef, and Avolio (2007) used in constructing the PCQ, which was to take existing published measures in the positive psychology literature and adapt the items to the workplace context. The drawback to using this approach is that some items that might have been developed to capture these constructs more fully may not have been included in the currently tested version of this PCQ instrument.

Third, although the two samples used in the study were diverse, they still represent a relatively small range of the potential working adults who would need to be included to test for external validity of the findings. This includes samples that would come from other for-profit and not-for-profit organizations, as well as non-U.S.-based samples.

Still another potential limitation is that we were able to only collect rated performance measures relatively soon after the intervention was completed. Future research should not only collect measures over a longer time span, but perhaps also focus on performance outcomes that would likely be most affected by increasing one's positive outlook (e.g., sustaining high levels of performance under duress). There would also seem to be future benefit from comparing the interventions here to other interventions, such as the work done by Eden and associates (Eden & Sulimani, 2002; Eden & Zuk, 1995) on developing Pygmalion effects.

It could also be useful to investigate whether our interventions create unique impact to other more general positive approaches to development. Specifically, are we simply enhancing general positivity, but not specifically the core components of hope, optimism, resilience, and efficacy? Along these lines, future research may want to collect data by having others evaluate the positive psychological dimensions in addition to the self-reported measure of PsyCap used in this research.

Lastly, we do not know whether one or more of the psychological capital components differentially created the effects found in this research. It is possible that focusing mainly on one component or two would have produced the same effects observed here with the overall PsyCap. Future research will need to determine how each component and combination of components impact performance in the short term and over time.

In addition to the longitudinal measurement of dependent variables, the sustainability of the PCI may also be best measured by longitudinal tests of the independent variable, in this case psychological capital. This type of test could follow the previous research conducted by Conley (1984) on the stability of psychological constructs and help to understand better the extent to which increases are sustained over multiple time periods. In addition, it has been suggested that interventions may be more effective on certain segments of the population (e.g., those initially low or initially high in the independent

variable; see Jordan, Ashkanasy, Härtel, & Hooper, 2002). To test this possibility, we did conduct a post hoc analysis based on a median split. Results indicated that the intervention increased the self-reported level of psychological capital more for those initially lower versus higher. However, it should be noted that the dependent variable change was not different between groups, nor could the threat of regression to the mean be ruled out. In any event, the tentative conclusion that the training intervention may be able to increase participants' positive psychological capital for a positive impact on their performance still stands.

Finally, there are obviously many ways to impact one's positive psychological dimensions individually and collectively. The PCI model guidelines used in this research only represent one such approach, which may or may not be optimal for PsyCap development. Specifically, we recognize the possibility of limited sustainability of these effects given the dynamic nature of organizations today and that we used only a short-duration intervention and evaluation on performance impact. For example, in a comprehensive analysis of leadership intervention research, Reichard and Avolio (2005) found that most leadership training interventions in organizations are short in duration, likely because of the need for less interruption. The duration of the intervention used in this study fits in with the majority (about two-thirds) of leadership interventions they studied, which were less than 6 hours in duration. In following this same strategy we provided initial evidence of the value for what may be termed a "micro" intervention in enhancing participants' psychological capital and resulting performance impact. Nevertheless, there is certainly a need for future studies to determine the sustainability of observed effects through longitudinal research designs and analyses.

Implications and Conclusion

This study has many direct implications for human resource development and performance management. The results provide initial empirical support for recent proposals that a core higher-order factor termed psychological capital or PsyCap and its components made up of hope, optimism, efficacy, and resilience may be open to organizational leadership and human resource development in the workplace. This research also begins the process of validation of a specific training model called the psychological capital intervention, or PCI, designed to enhance organizational participants' overall level of PsyCap with resulting performance improvement.

Although there are a growing number of correlation studies indicating that PsyCap is related to attitudes, behaviors, and performance in the workplace, this is the first study to demonstrate that an organizational participant's PsyCap can be developed, which results in performance improvement. Thus, as a practical human resource development and performance management technique, managers can follow the guidelines provided by the PCI

model used in this study (see Figure 1 and Appendix) and potentially enhance their own and their associates' performance. By investing in and developing their own and their people's positive psychological capital, organizational leaders and human resource development initiatives may be able to leverage and obtain a high return on development (i.e., ROD) with resulting competitive advantage (see Luthans, Avey et al., 2006, and Luthans, Youssef, & Avolio, 2007, Chapter 8, for such utility analysis for PsyCap).

For the future, research needs to test if other positive constructs such as courage or wisdom (see Luthans, Youssef, & Avolio, 2007, Chapters 6 and 7, and C. Peterson & Seligman, 2004) can be developed for positive performance impact, and/or if other outcomes such as retention, safety, customer satisfaction, and work-related attitudes can be positively impacted. In addition, given that relationships between variables do not occur absent the context in which interventions are being implemented, we propose contextual predictors, moderators, and outcomes may be a beneficial, additive next step in pursuing this line of research (e.g., see Luthans, Norman et al., 2008). Of particular potential may be the emerging theory and research on authentic leadership (Avolio, Gardner, Walumbwa, Luthans, & May, 2004; Gardner, Avolio, Luthans, May, & Walumbwa, 2005) and how leaders can foster environments conducive to developing positive psychological capital.

In conclusion, a resource-based view (Barney, 1991) suggests that human capital may be critical to organizations trying to create sustained competitive advantage. The torrents of today's volatile global economy call for different or at least generally underrecognized and largely untapped positive psychological constructs. We have demonstrated in this research that the development of recently emerging psychological capital may provide human resource development with a new and potentially very impactful approach. Specifically, human resource development may be able to facilitate organizational leaders and their associates to become more resilient to increasing adversity, more efficacious in getting the job done, more optimistic about the future, and more hopeful in determining plans and alternative pathways to accomplish goals. In other words, HRD can implement programs such as the one tested in this research to have their organizations benefit from the synergies of positive psychological capital for performance improvement in today's extremely challenging and turbulent environment.

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Fred Luthans is with the Department of Management, University of Nebraska-Lincoln.

James B. Avey is with the Department of Management, College of Business, Central Washington University.

Bruce J. Avolio is with the Foster School of Business, University of Washington.

Suzanne J. Peterson is with the W. P. Carey School of Business, Arizona State University.



Appendix: Positive Psychological Capital Training Intervention Summary

Hope Development

The hope construct was impacted by influencing goals, pathways, and agency. Specifically, participants practiced generating work-related goals that were personally valuable, reasonably challenging, and included a clear beginning and ending point. These goal characteristics generate sustained motivation, thus using goal components to increase agency. In addition, participants practiced generating multiple pathways to their work-related goals and identified obstacles for which to plan. After completing the exercise individually, each participant received feedback from the group regarding additional pathways that could be utilized and additional obstacles to expect. This practice increased pathway generating and ability to plan for obstacles, thus reducing the negative impact of obstacles on agency.

Optimism Development

Building efficacy for pathway generation and obstacle planning provided a foundation for generally positive expectations. When participants were confident that they could identify and plan to overcome obstacles, the expectation of achieving the goals increased. Negative expectations that goals would not be accomplished were challenged as individuals began to see pathways to success and options to overcome obstacles. Group feedback increased positive expectations as individuals saw group members were also expecting and making plans for success. Thus, participants' expectations for success increased which increased optimism.

Efficacy Development

Participants practiced setting up stepwise techniques to accomplishing goals. Next, they explained each subgoal to the group answering questions about how it would be accomplished. Task mastery for designing and pursuing goals was attained through this process. Next, vicarious learning took place as each participant saw peers work toward their goals or hear success stories about how goals were obtained. This stage, including emotional arousal, was influenced by positive expectations of achieving goals as well as by social persuasion by the facilitator and group members that goals would be accomplished by validating schedules and timelines for their goals.

Resilience Development

Resilience was increased by building awareness of personal assets in the form of talents, skills, and social networks. Participants were asked what

resources they could leverage to accomplish a given goal. After creating the list of resources, the facilitator and peer-group members identified additional resources participants did not list as resources. Participants were then encouraged to leverage these resources as necessary. Similar to the planning for obstacles, participants were encouraged to identify in advance obstacles that could impede their progress. Although in the hope exercise the focus was on making plans to overcome these obstacles, in this resilience exercise the focus was on making plans to avoid the obstacles/prevent them from becoming legitimate concerns. Finally, the influence process was impacted by helping participants to become aware of initial thoughts and feelings when facing adversity (i.e., confident or in despair) and to choose resilient thoughts based on resources and options available to overcome adversity.

Source: Adapted from Luthans, Avey et al., 2006, and also found in Luthans, Youssef et al., 2007.