Psychological Capital Intervention (PCI): A Replication and Extension

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Abstract

Psychological Capital (PsyCap) is a positive individual characteristic and its malleability and openness to development have made it the focus of considerable attention in recent years. A training procedure for improving individuals' PsyCap has been advanced and tested by Luthans and colleagues in a North-American sample. The purpose of the current study was to generalize the effectiveness of the PsyCap Intervention (Luthans et al., 2006) when conducted by different trainers (i.e., replication), and to explore its longer term effects (i.e., extension). We trained a pooled sample (N = 40) of students and professionals in Bulgaria and conducted a one-month follow-up assessment of PsyCap in order to examine the durability of the training effects. The statistical analyses revealed significant improvements in the overall PsyCap after training as well as in each of its four dimensions, namely self-efficacy, hope, resilience and optimism; remarkably, these improvements remained stable over one month, attesting to the durability of the training effects in the samples of both students and professionals. These results contribute to the accrual of scientific knowledge on a theory-driven and evidence-based HRD intervention.

The Psychological Capital (PsyCap) construct, defined as a set of positive psychological resources (Luthans, 2002), has come into widespread use over the last decade. Considerable empirical evidence points to its well-established relationship with a number of positive organizational outcomes (e.g., job satisfaction, psychological wellbeing, job performance, organizational citizenship behaviors; for a meta-analysis see Avey, Reichard, Luthans, Mhatre, 2011). Moreover, one of the core characteristics of PsyCap is its state-like nature and this makes it open to development. Luthans and his associates (Luthans, Avey, Avolio, Norman, & Combs, 2006) set out a training procedure developing PsyCap that was empirically tested in two samples of North Americans: one of students and another of managers (Luthans, Avey, Avolio, & Peterson, 2010). However, to the authors' knowledge, this training known as PsyCap Intervention (PCI) has not been replicated in different settings, with distinct populations, or (more importantly) conducted by training facilitators other than the original authors of PsyCap (i.e., with the potential "experimenter bias" that we will discuss in the remainder of the introduction).

On the other hand, we believe that it is important to verify the extent to which the methods and tools available for developing PsyCap can be generalized. In fact, a lively debate (Makel, Plucker, & Hegarty, 2012) has recently emerged among social scientists on the occurrence and value of replication studies for theory building and testing, for knowledge accumulation and, ultimately, for scientific progress (Eden, 2002; Tsang & Kwan, 1999).

Replication studies are not only of scientific value, but their practical contribution should also be underlined. It is vitally important in the field of Human Resource Development in particular to replicate interventions in order to attest to their generalization. It is well-established that trainers play a critical role in the effectiveness

of training programs (Burke & Hutchins, 2008; Towler & Dipboye, 2001); indeed, they are mentioned as one of the main elements when evaluating training. Thus, replicating the success of a training program with different trainers sheds light on the soundness of the intervention.

Moreover, building on the replication of a training intervention implies taking it further and *extending* it, notably by exploring the time frame in which its positive effects remain visible. In effect, one of HRD practitioners' main concerns is to make sound decisions on the level of investment in given development activities and predict their longer-term benefit to an organization. In this respect, there is no evidence of the time frame in which the PsyCap remains enhanced due to the training as the durability of PCI effects has not yet been ascertained.

The identification of these two main gaps in the literature prompted our research. Our goals are: (1) to generalize the PCI's effectiveness when conducted by different trainers; (2) to test the durability of the PCI with a one-month follow-up.

Psychological capital and its components

The construct of psychological capital first appeared in the literature in 2002 (Luthans, 2002); a rudimentary search in PsycInfo with the keyword "psychological capital" revealed that it has prompted around 100 papers in the last decade. It is rooted in and actually represents the core construct of Positive Organizational Behavior (POB), namely "*the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement*" (Luthans, 2002, p.59). This definition immediately reveals that the contemporary organizational behavior field deals with individuals' positive characteristics (i.e., strengths), and second that these characteristics can be enhanced. Specifically, PsyCap is concerned with "who you are" but, more importantly and from a

developmental perspective, "who you are becoming" (Luthans, Youssef, & Avolio, 2007, p. 20). These features also make PsyCap of interest to HRD professionals; their job is to equip organizations with the best talents who strive to contribute to their organization's success (Alkire & Avey, 2013; Luthans, Vogelgesang, & Lester, 2006).

PsyCap represents a broader concept that encompasses lower-order variables, namely self-efficacy, optimism, hope, and resilience (Luthans, 2002; Luthans & Youssef, 2004). Thus, a comprehensive definition of PsyCap 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).

Self-efficacy has been extensively studied in all fields of psychology, as well as in organizational behavior and human resource management. It identifies an individual's belief about his or her ability to successfully execute a specific task within a given domain. While self-efficacy is a belief about the likelihood of success linked to one's own abilities, optimism is an expectation about positive outcomes related to a more general positive view of the world (Luthans et al., 2010). Optimists are people who always expect good things to happen and, instead of simply sitting back and waiting for them to come, they also understand the need to play an active role in influencing such positive outcomes. In addition, they assume that adversities can be overcome successfully whenever they arise. In this respect, optimism is theoretically close to the other two components of PsyCap, namely resilience and hope. Resilience is

an individual's adaptive response to adverse events and stems from the interaction with the environment and the processes that either promote well-being or protect against risk factors (Reich, Zautra & Hall, 2010); these processes can be individual coping strategies, or may be helped by good organizational contexts and practices (Peters, Leadbeater & McMahon, 2004). In other words, "resilience" occurs when there are cumulative "protective factors". Finally, hope is goal-directed thinking in which people perceive that they can produce routes or pathways to desired goals - and the essential motivation to use them - namely, agency thinking (willpower). Goals may vary temporally from short to long term, but they must be of sufficient personal value for a person to engage in them (Lopez, Snyder, Pedrotti, 2003).

Developing PsyCap

The innermost feature of PsyCap that distinguishes it from other similarly positive-oriented constructs (e.g., core self-evaluation) is its malleability and openness to development (Luthans et al., 2007), which brings us back to the traditional distinction between trait- and state-like constructs. A longitudinal study (Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011) has documented intra-individual changes in PsyCap over a period of seven months, and showed how these changes are linked to changes in subsequent job performance. An important implication of this study is that it is possible, and worthwhile, to invest in developing PsyCap.

Drawing on previous literature corroborating the effectiveness of interventions for developing each of the four components (e.g., Bandura, 1997; Masten, 2001; Seligman, 1998; Snyder, 2000), Luthans and colleagues (2006) advanced their proposal for a "micro-intervention", the Psychological Capital Intervention (PCI). A short workshop (from 1 to 3 hours) is proposed as this meets the need of maximizing the results within a short time frame.

According to the authors, each of the psychological constructs encompassed in PsyCap can be developed when addressed by specific exercises during the workshop. For Hope, the training is based on helping the individual adopt an approach (rather than an avoidance) orientation (Elliot, 1999) and stimulating him/her to be more pragmatic through goal setting. The Self-efficacy component is addressed through three of the four well-known sources of efficacy beliefs, namely active mastery (participants actively engage in the goal setting exercise, which also offers the opportunity to build efficacy by facilitating the visualization of a successful scenario); modeling or vicarious learning (participants share their goals with each other and make suggestions); social persuasion and positive feedback (the training facilitator and the other participants provide positive reinforcement about goal achievement). The theoretical underpinning for building Resilience is to activate cognitive, emotional and behavioral processes that can change an individual's perception of his/her influence on the external conditions. Therefore, an exercise that visualizes and anticipates possible setbacks allows people to increase their ability to mentally re-frame those circumstances. Finally, for Optimism, self-talk (Meichenbaum, 1975), namely the technique of rephrasing negative and self-debilitating thoughts, is the main source for increasing an individual's positive expectations and attributions.

The training was first conducted using online technology (Luthans, Avey, & Patera, 2008) and confirmed the expected positive effect of increasing the participants' PsyCap when compared to a control group that was involved in a traditional decision-making exercise rather than in the target workshop. Subsequently, the PCI was also tested in a face-to-face small-group workshop (Luthans et al., 2010). Using a pre-test post-test design with a double sample of students and managers respectively, the authors measured the participants' PsyCap one week before and one week after the workshop

and showed that it had improved significantly, as had the professionals' performance. With regard to the face-to-face workshop, the authors developed and provided more operative guidelines for HR experts on how to conduct the training session.

Types of Replication studies

Many philosophers of science (Popper, 1959; Radder, 1996) believe that the replication of empirical research findings is at the core of the scientific approach and serves several functions. Besides the straightforward confirmation of a theory and previous results, it also helps refine a given theory by progressively adding boundary conditions and/or explanatory mechanisms that are tested by gradually changing some of the features in the primary study (Eden, 2002; Tsang & Kwan, 1999). Therefore, distinct functions are pursued depending on the design of the replication studies and their ratio of similarity/dissimilarity with the original study (Schmidt, 2009); these designs have been classified into several taxonomies.

The typical "operational" replication implies an exact replication of all the features (i.e., conditions, procedure, experimenter, etc.) and would allow a control to be made for sampling errors and the possibility that the first results were obtained by mere chance. The more varied the details, e.g. using a different group of researchers, in a different lab, or even altering the research procedure, the more we move toward a "conceptual" replication aimed at confirming the underlying hypothesis of the first experiment/research (Schmidt, 2009).

Rosenthal (1990) also identified three broad features distinguishing replication studies, namely the time (how close in time is a replication study to the primary research?); the procedure (are the methods of the first research retained, and if not, how was the original study modified?); the actor (is the replication study conducted by the same or a different research group?).

A similar, and partly overlapping, taxonomy has been advanced by Tsang and Kwan (1999) who considered two research aspects to create a 2x3 matrix defining six different types of replication studies. These aspects were the population or context and the measurement/analysis; accordingly, replication studies may be based on the same dataset, the same population but different dataset, or a totally different population, and may vary in terms of the measures adopted or the analyses performed. The most complex condition, defined as "generalization and extension", is when the original hypotheses are tested on a different population using different measurement or analytical techniques.

Our research fits into this category as it was aimed at generalizing the effectiveness of the PCI to a different population and extending it by employing a different analytical strategy. With regard to the population, we planned to involve the same kind of sample (students and professionals) but from a different country. As for the analytical strategy, we adopted an experimental design measuring PsyCap at three points in time. This enabled us to analyze the data by means of a repeated-measures within-subjects technique (i.e., General Linear Model) and ultimately extend Luthans et al.'s (2010) study by testing the stability of the PsyCap enhancement in a one-month time frame.

Lastly, the group of researchers conducting our replication study was different from the original team. Although this last feature is not explicitly encompassed in any of the categories of Tsang and Kwan (1999), it is mentioned by several authors and is of paramount importance. It responds to the issue of the potential "experimenter bias", namely the tendency to unintentionally "create" or publicize the expected result, which would also explain the generally higher rates of successful replications conducted by the same group of researchers (Makel et al., 2012). This is even more crucial in cases like

ours that replicate a training intervention. It is common knowledge in the HRD domain that training facilitators have a major effect on training effectiveness due to their knowledge, expertise, background and expressiveness (Burke & Hutchins, 2008; Towler & Dipboye, 2001); thus, it is essential to establish that the proposed procedure is effective when conducted by different facilitators.

Method

Participants and Procedure

A pooled sample of Bulgarian students and professionals was used in this study. The initial sample consisted of 78 individuals (50 students and 28 professionals). The average age was 23.7 years (SD = 4.7) and 35% were male. The vast majority of students (88%) were enrolled in a business or economics-related degree (e.g., Management, Finance, International Economic Relations, Accounting and Control) and mainly (42%) in the third year of their Bachelor studies, while professionals occupied a variety of jobs in a wide range of sectors, including accounting (11%), customer support (7%), IT (7%), and graphic design (7%). The professionals had an average work experience of 5.9 years (SD = 2.3) and average job tenure of 2.5 years (SD = 2.2). The final sample that participated in the training and completed the follow-up questionnaire consisted of 40 individuals (26 students and 14 professionals, 51% completion rate). We conducted a Pearson's Chi-Square test for gender and a T-test for age in order to compare participants and non-participants. They did not differ significantly with regards to gender ($\chi^2(1) = .42$, $p = 0.52$) or age ($t = -.36$, $p = .72$).

Students were approached through an international student organization (AIESEC) based at the University of Varna, while the professionals were contacted through a local community center in the Burgas region. They were asked to participate in a short personal development workshop advertised as "H.E.R.O.", an acronym

obtained with the initials of the four PsyCap components. Two sessions of the same workshop were held, for students and professionals respectively. Individuals were asked to fill in the PsyCap questionnaire three times during the research period – before the training (Time 1), immediately after the training (Time 2) and in a follow up around one month later (Time 3). However, people that opted out of the training only answered the first questionnaire and could not be contacted again. Unlike the participants, their questionnaires were anonymous which prevented us from using the non-participants as a control group. Therefore, we asked the same organizations to send out another email to their affiliates some months after, in order to recruit an additional comparison group. In this case, people were asked to fill in the same questionnaire twice, one month apart, without offering participation in any training. Out of 200 questionnaires, 27 could be matched over time (13.5% rate), and specifically 12 for students and 15 for professionals. The low response rate might be explained by the fact that people were not willing to commit to answering the questionnaire twice. However, the characteristics of the comparison group resemble those of the treatment group, with virtually no significant differences: forty-four percent were male ($\chi^2(1) = .60$, $p = 0.44$) and the average age was 24.5 ($SD = 3.2$; $t = -.75$, $p = .45$). The professionals had an average work experience of 3.9 years ($SD = 2.1$; $t = 2.29$, $p = .03$) and 1.7 years of job tenure ($SD = 1.3$; $t = 1.17$, $p = .25$).

Implementing the Training

The intervention closely followed the PCI guidelines described in Luthans et al. (2010). Accordingly, it included four main exercises as well as a small group session for positive thinking and it lasted a total of three hours. In addition to the original procedure and drawing from the organizational psychology literature, we explicitly structured the training in such a way that participants would work individually, in small groups and in

plenary sessions in order to make the most of their resources. The few small additions or specifications of the exercises are described in more detail below.

The starting point was a goal setting exercise. Individuals were informed about the main characteristics of goals (i.e., SMART; Specific, Measurable, Attainable, Relevant, Time-bounded) and invited to set three goals for the near future. Subsequently, participants were asked to choose one of these and to think (individually) of different ways to achieve it, generating alternative pathways but also anticipating potential obstacles and ways of overcoming them. Once the pathways were realistically identified (i.e., with an awareness of potential difficulties), the training facilitator asked them to set specific sub-goals that would ultimately lead to the achievement of the main goal. Finally, participants were asked to list all the resources available to them during that process, taking care to identify both individual and contextual (i.e., internal and external) resources. The second part of the training was conducted in small groups of 4-5 people where each of them shared their plans with the peers. Participants were encouraged to provide constructive feedback as well as to advance ideas, solutions, and in general a different perspective to improve each other's plans. Finally, there was a "positive brainstorming" task that involved the whole group. Participants were called on to contribute positive phrases, thoughts, or quotes that could bring inspiration and support as they moved toward their goals on a daily basis in face of difficulties and setbacks.

Although it is difficult to disentangle the impact on each single component, theory helps explain the expected effect of a given exercise. The first exercise, inspired by the traditional principles of goal setting as well as the more recent distinction between proximal and distal goals (Locke & Latham, 2012), was aimed at developing hope by triggering the generation of pathways and therefore affecting the individual

agency through goal-directed thinking. The prefiguration of possible obstacles and alternative solutions is also consistent with the self-regulatory strategy of implementation intentions (Gollwitzer, 1993) that targets not only hope but also self-efficacy by operating on some of its main underlying cognitive abilities, namely anticipation, self-regulation and self-reflection (Bandura, 1997). Self-efficacy was also boosted through the vicarious experience (i.e., listening to peers' plans) provided in the small-group stage in the second part of the workshop – traditionally one of the sources for enhancing self-efficacy (Bandura, 1997). Resilience was explicitly addressed through raising the awareness of assets and resources available or that could help them bounce back in case of adversities. Finally, the collective exercise on positive thinking exploited verbal persuasion as an additional source for developing self-efficacy, and built on self-talk techniques to improve optimism since positive self-talk methods can be taught with success (Shantz & Latham, 2012). Consistent with the broaden-and-build framework, experiencing positive emotions and thoughts leads to a higher level of learning and, thus, to success (Fredrickson, 2001).

At the end of the training, but only after filling in the questionnaire again, participants were debriefed about the PsyCap construct and the conceptual underpinning of its four dimensions.

Measures

PsyCap was measured on all three measurement occasions using the 24-item psychological capital questionnaire (PCQ; Luthans, Youssef & Avolio, 2007), validated by Luthans et al. (Luthans, Avolio, Avey, & Norman, 2007). Permission was obtained to use the PCQ for research purposes from www.mindgarden.com. Responses used the typical 6-point Likert-type scale ranging from 1 = "Strongly disagree" to 6 = "Strongly agree". The questionnaire was translated from English to Bulgarian by a Bulgarian

native-speaker, whose work was further refined by a second independent translator. For the purposes of this study, slight alterations were introduced in the original wording of the items in order to adapt their meaning to the academic setting for the student sample. Sample items are: “If I should find myself in a jam in my studies/projects, I could think of many ways to get out of it”, ““I always look on the bright side of things regarding my studies”. Chronbach’s alpha coefficients, calculated on the questionnaires collected at Time 1 to guarantee the reliability of the measure in subsequent comparisons, showed satisfactory levels. The alpha for the whole scale was .88; it was .84 for the Self-efficacy subscale, .75 for the Hope subscale and .70 for the Optimism subscale; however, the Cronbach’s alpha only reached .60 for the Resilience subscale.

Results

Prior to testing the effectiveness of the training, we checked for potential biases in sample selection. To this end, we conducted a One-way ANOVA with Psychological Capital at Time 1 as dependent variable and the participation vs. non-participation in the training as grouping variable. The results showed that there were non-significant differences between those who decided to take part in the workshop and those who did not with regard to their starting level of PsyCap ($F = .26$, $p = .61$). In addition, the Levene test ($F = 1.88$, $p = .17$) and Shapiro-Wilk test ($S\text{-}W_{(non\text{-}participants)} = .96$, $p = .15$; $S\text{-}W_{(participants)} = .98$, $p = .81$) supported the assumption that the variances in the participants’ and non-participants’ groups are homogenous and that these samples come from the same, normally distributed, population. Therefore, we conclude that there was not a systematic bias affecting the self-selection of training participants.

---------- Insert Table 1 about here ----------

Table 1 presents the means of PsyCap and each dimension for the pooled sample that participated in the workshop and the two subsamples, of students and professionals, separately. On first inspection, we can observe an increase in the means from Time 1 to Time 2 and 3. However, we tested for statistical differences using a repeated-measures general linear model (GLM) for PsyCap and each of the four components with Time (T1, T2, and T3) as the within-subjects factor and Student/Professional status as the between-subjects factor. GLM confirmed that the differences in the means of PsyCap were statistically significant ($F = 17.52$, $p < .01$) and the pairwise comparisons showed that this difference was significant from Time 1 ($M = 4.64$) to Time 2 ($M = 4.92$) and Time 3 ($M = 4.9$) respectively, whereas there was no further improvement from time 2 to Time 3. When we looked at the single components of PsyCap, we found the same pattern of results for Self-efficacy ($F = 8.53$, $p < .01$), Hope ($F = 10.46$, $p < .01$) and Optimism ($F = 12.94$, $p < .01$). With reference to Resilience, we also found a significant difference in the within-subjects model ($F = 6.31$, $p < .05$), but in this case the pairwise comparisons revealed that the improvement only occurred after a longer time lag ($M_{(T3)} = 4.93$) and not immediately after the training ($M_{(T1)} = 4.71$ vs. $M_{(T2)} = 4.87$).

---------- Insert Table 2 and Table 3 about here ----------

Finally, GLM showed no between-subjects effects (i.e., students vs. professionals), and no significant interaction between their status and time (see Table 2). Thus, we can conclude that the training was as effective for the students as for the professionals. As further evidence, we plotted the GLM results for PsyCap and each dimension comparing the two groups and report them in Figure 1 and 2.

---------- Insert Figure 1 and 2 about here ----------

Additional support for the effectiveness of the training intervention comes from the comparison group. The respondents in this group did not differ from the trained group with regards their starting level of PsyCap ($F = .64$, $p = .43$) or its components ($F = 2.79$, $p = .10$ for Self-efficacy; $F = .04$, $p = .83$ for Hope; $F = .28$, $p = .60$ for Resilience; $F = .03$, $p = .85$ for Optimism) but, contrary to the treatment group, they did not show any significant change after one month (see Table 3). Finally, we conducted an ANCOVA comparing the means of the treatment and comparison groups at Time 3 while controlling for the respective values at Time 1. The results showed that the mean of PsyCap was significantly higher in the treatment group ($M = 4.90$) than in the comparison group ($M = 4.74$) although two of the components, namely self-efficacy and resilience, did not differ ($M_{Self\text{-}efficacy\_Treatment} = 4.99$ vs. $M_{Self\text{-}efficacy\_Comparison} = 4.98$; $M_{Resilience\_Treatment} = 4.92$ vs. $M_{Resilience\_Comparison} = 4.81$). In addition to the significance test, we report the Cohen's d effect size and the effect-size correlation and we note that all the effects, including Resilience, are small to moderate with the exception of self-efficacy, which is negligible.

Discussion

The purpose of this study was twofold: to generalize the effectiveness of the PsyCap Intervention (Luthans et al., 2006; Luthans et al., 2010) when conducted by different trainers, and to explore its longer term effects. This has a straightforward practical value as HRD experts need evidence-based interventions of proven effectiveness. We tested our assumptions in a pooled sample of students and professionals from Bulgaria. Thus, consistent with the tradition of replication studies (Tsang & Kwan, 1999), some of the characteristics of the original study remained

constant, particularly with regard to the training procedures and the type of sample. However, we also introduced some variations in the context – notably the trainers; this configured our study as a generalization of the Luthans et al.'s (2010) training intervention.

A replication with different facilitators is of paramount importance because the success of workshops often relies on the trainers' expressiveness, competence and confidence (Burke & Hutchins, 2008; Towler & Dipboye, 2001), and these aspects are typically considered when measuring participants' reactions to training (Morgan & Casper, 2000). Thus, ascertaining that a proposed training intervention is effective per se, regardless of the person delivering it, is an important contribution to literature and practice. Due to the inclusion of a follow-up measure of PsyCap one month after the intervention and the use of a different analytical technique, our study is also characterized as an extension of the original because it contributed to increasing our knowledge about the durability of the positive effects obtained.

Our analyses revealed a within-subject development of PsyCap over time, with a significant improvement from Time 1 to Time 2 that remained constant after a one-month lag (Time 3). This trend was observed for both the single components and the overall construct, with the noteworthy exception of Resilience. In this case, the significant improvement did not take place immediately after the training (i.e., from Time 1 to Time 2), but only appeared in the follow-up (i.e., from Time 1 to Time 3).

Our interpretation of the above finding is that direct experience may heighten the ability to bounce back from failures, overcome obstacles or effectively face difficulties. During the workshop, the main exercise that addressed this ability involved participants listing the resources available to them to overcome a setback. Participants had to rely on the imaginative and anticipative cognitive capability to raise their awareness about their

resources, but this was not necessarily enough to enhance their resilience. However, one month later, during which we assume they had made some progress toward their goals (for example, the sampled students had exams during that month) and tested their potential resources, they were better able to cultivate their resilience.

This change in resilience over one month can be viewed as behavioral transfer or generalization (Baldwin & Ford, 1988; Colquitt, LePine, & Noe, 2000), as participants likely used the resources identified during the workshop and this ultimately increased their resilience. In line with our reasoning, Werner, O'Leary-Kelly, Baldwin, and Wexley (1994) found that learning retention was significantly higher one month after the training. Similarly to the above-cited research, we assume that this result might have occurred because participants felt that the training was not concluded with the workshop, and that they had to try to put into practice what they had experienced and reflected upon in the classroom. As further support to our interpretation, it is worth recalling that the so-called “opportunity to perform” is mentioned as one of the factors with moderate to strong impact on training transfer (Burke & Hutchins, 2007).

The present research not only sheds light on the durability of the effects of PCI, but also furthers our knowledge of the development of each PsyCap component. Although it is not possible to identify a direct link between each exercise and the increase in one of the personal strengths, we go further than previous studies by looking at hope, self-efficacy, optimism and resilience separately and corroborating their development. Finally, the results of the between-subjects section of our model lends additional support to the effectiveness of the training by showing that there was no difference in the way students and professionals responded to the workshop, as the trend for both sub-samples was the same. Thus, as in previous studies, the PCI is effective with both students and professionals.

Finally, reflection should be given to the finding that the magnitude of the change in self-efficacy was negligible when contrasting the treatment and the comparison groups. The small sample size could undoubtedly have played a role in this, but most of all we believe it is related to the intra- vs. inter-individual differences. Although the mean of self-efficacy at time 3 is not different for the two samples taken together, the confidence of single individuals within the treatment group enhanced after the training, which was not the case in the comparison group. We can only speculate as to whether such an improvement in self-efficacy is starting a descending parabola at time 3 or, on the other hand, some individuals in the comparison group underwent positive experiences during the one-month lag that enabled them to preserve a good level of self-efficacy. Nevertheless, the workshop succeeded in strengthening individuals' beliefs in their self-efficacy, and perhaps of those individuals that started with the lowest levels in particular.

Limitations and future research

We acknowledge the following limitations of our study. First, we did not randomly allocate subjects to the "treatment" and the "comparison" group, and we did not measure other characteristics of the individuals who originally decided to participate in the training or of those that opted out. This may cast doubts on the internal validity of the training because of the potential non-equivalence of the groups. Nevertheless, we were able to show that there was no systematic difference between participants and non-participants in the PCI based on their levels of PsyCap, which is precisely the characteristic we aimed to influence with the training. Of course, there may be other individual characteristics we did not measure which account for the self-selection of the sample, such as learning goal orientation and intrinsic motivation. However, this resembles what can happen in organizations when employees are involved in training

and development activities; individuals are often offered a list of courses by the company's HR department, and the reason for attending one or the other is frequently unknown. In fact, assessing and showing the effectiveness of initiatives are major concerns for HR professionals. Future studies aimed at further testing of the PCI's effectiveness may include other psychological measures that can help explain individual motivation to participate as well as transfer the contents acquired during the training (Burke & Hutchins, 2008).

A second limitation, and potential threat to the internal validity of the study, is the collection of the comparison group after several months. Clearly, the possible influence of external factors on the comparison group cannot be ruled out, although we showed that the two groups did not differ in their demographics (except professionals' work tenure, which was higher in the treatment group) or in their initial PsyCap levels.

Another limitation relates to the reliability of the Resilience subscale that is below the commonly accepted value of .70. This, combined with the finding that individuals' resilience only improved significantly some time after the training rather than immediately, may point to a "beta" or "gamma" change, in other words, to a learning effect. It is likely that people need to start pursuing their goals and perhaps experience set-backs before they can answer questions about their resilience capacity. Thus, by the third data collection they may have developed a different understanding of the questions and/or a "rescaling" of the answering anchors. However, it is worth noting that as this did not happen in the comparison group, the learning effect may be tied more with the training itself rather than the repeated exposure to the same questionnaire. All in all, the overall PsyCap scale reliability is sufficiently high (.88) not to undermine our confidence in the results obtained from the training. An alternative that cannot be ruled out is that the Bulgarian version for that subscale is not as accurate as for other

languages (although we note that the Resilience alpha coefficient reported for the English version is often below .70; Luthans et al., 2007; 2010). Future research efforts should address a cross-cultural validation of the PsyCap scale or the use of the more recent implicit measure of PsyCap (Harms & Luthans, 2012), notably to avoid "learning effects" when administering the same scale more than once in a short time frame.

Moreover, we did not collect a measure of social desirability response, so could not control for its impact on our results. However, we believe that it would not completely explain the differentiated pattern of our results (i.e., some of the components increased immediately after the training whereas resilience only increased at Time 3).

Additional directions for future research include investigating the durability of the workshop effects over longer time frames (e.g., 6 to 12 months) and, most notably, exploring possible "recalls" or follow-up exercises to prolong the effectiveness without repeating the same training. Lastly, future studies could explore the differential impact of the intervention on individuals with higher or lower starting level of PsyCap and its single components in order to identify who responds to it more effectively.

Implications and Conclusions

An important implication for theory is that our findings can be generalized to similar state-like constructs, for example positive and negative affect. Affects are broader than emotions and more stable (George, 2011), therefore configuring as a state-like construct. We can infer that a short training session aimed at improving positive and reducing negative affects, based on cognitive exercises like those included in the PCI would be as effective as the PCI and its effects would last at least one month.

From a practical standpoint, the value of this replication and extension resides in the generalization of not only research findings but more importantly a training program conducted by different facilitators. The effectiveness of a training workshop is strongly

influenced by the trainers conducting it, and the results obtained in this study encourage other colleagues to adopt the PCI in the confidence of a good outcome. This is vital for HR professionals who operate in increasingly globalized companies with dispersed workforces and who want to adopt evidence-based homogenous tools and methodologies. Likewise, this replication is also of value for small companies that lack sufficient internal resources and therefore rely on external consultants to help with staff development.

Both the short duration of the training (i.e., three hours) and its durability underscore the efficient contribution these workshops make to the growth of a company's human capital. Given the limited time consumed and costs involved along with the potential positive effects on the employees and the organization, this training can be considered a low budget human resources investment. While additional evidence tracking the durability over 6 or 12 months from the training would undoubtedly be welcome, our study at least provides a first contribution in that direction. On the other hand, our contribution of the 1-month durability of the intervention coupled with its effect size does provide HRD practitioners with essential information to calculate the utility analysis in advance of the workshop; this gives organizations a sound basis on which to make decisions regarding training and development investments (Cascio & Boudreau, 2011).

In conclusion, the PCI proved an effective and efficient methodology that HRD professionals can confidently apply to develop employees' psychological strengths and resources and with visible longer-term effects. It is also hoped that the present replication and extension will serve as a boost for other studies aiming at following up and replicating theory-driven interventions because only when equipped with sound evidence-based methodologies can HRD professionals assess their quality and decide

about their implementation in organizational settings due to their accredited contribution.

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Table 1 - Means and standard deviations of PsyCap and its components in the trained group

	Pooled Sample		**Students**		**Professionals**	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
PsyCap_T1	4.64	0.46	4.71	0.39	4.52	0.54
PsyCap_T2	4.92	0.37	4.95	0.36	4.86	0.39
PsyCap_T3	4.90	0.50	4.96	0.53	4.79	0.44
Self-Efficacy_T1	4.71	0.69	4.73	0.68	4.69	0.74
Self-Efficacy_T2	5.09	0.52	5.10	0.53	5.08	0.51
Self-Efficacy_T3	5.00	0.62	4.99	0.71	5.00	0.42
Hope_T1	4.78	0.59	4.85	0.55	4.67	0.65
Hope_T2	5.07	0.53	5.15	0.48	4.95	0.60
Hope_T3	5.04	0.65	5.10	0.71	4.92	0.53
Resilience_T1	4.71	0.59	4.81	0.50	4.56	0.71
Resilience_T2	4.87	0.44	4.92	0.43	4.79	0.47
Resilience_T3	4.93	0.61	5.03	0.59	4.75	0.64
Optimism_T1	4.35	0.61	4.47	0.53	4.15	0.71
Optimism_T2	4.65	0.60	4.66	0.61	4.63	0.62
Optimism_T3	4.64	0.64	4.73	0.70	4.49	0.52

Table 2 - GLM between-subjects effects

	Status (Professionals vs Students)		**Status*Time**	
	F	*p value*	*F*	*p value*
PsyCap	1.33	0.26	0.02	0.88
Self-Efficacy	0.01	0.93	0.05	0.82
Hope	1.09	0.30	0.00	0.96
Resilience	1.86	0.18	0.04	0.85
Optimism	1.13	0.29	0.17	0.68

Table 3 - Results from the comparison group

	GLM[a]		ANCOVA[b]		Effect Size[c]	
	F	*p value*	*F*	*p value*	*d*	*r*
PsyCap	0.11	0.75	8.04	0.01	.34	.17
Self-Efficacy	0.13	0.72	1.97	0.17	.02	.01
Hope	0.06	0.80	6.96	0.01	.41	.20
Resilience	0.04	0.85	2.48	0.12	.19	.09
Optimism	0.23	0.63	4.03	0.05	.38	.18

[a] Within-subject effect of time in the comparison group

[b] Between-subject differences in Time 3 of the treatment vs. comparison group controlling for Time 1 measures

[c] Effect size of the differences observed between treatment and comparison group

Figure 1 –PsyCap development over time in the two groups

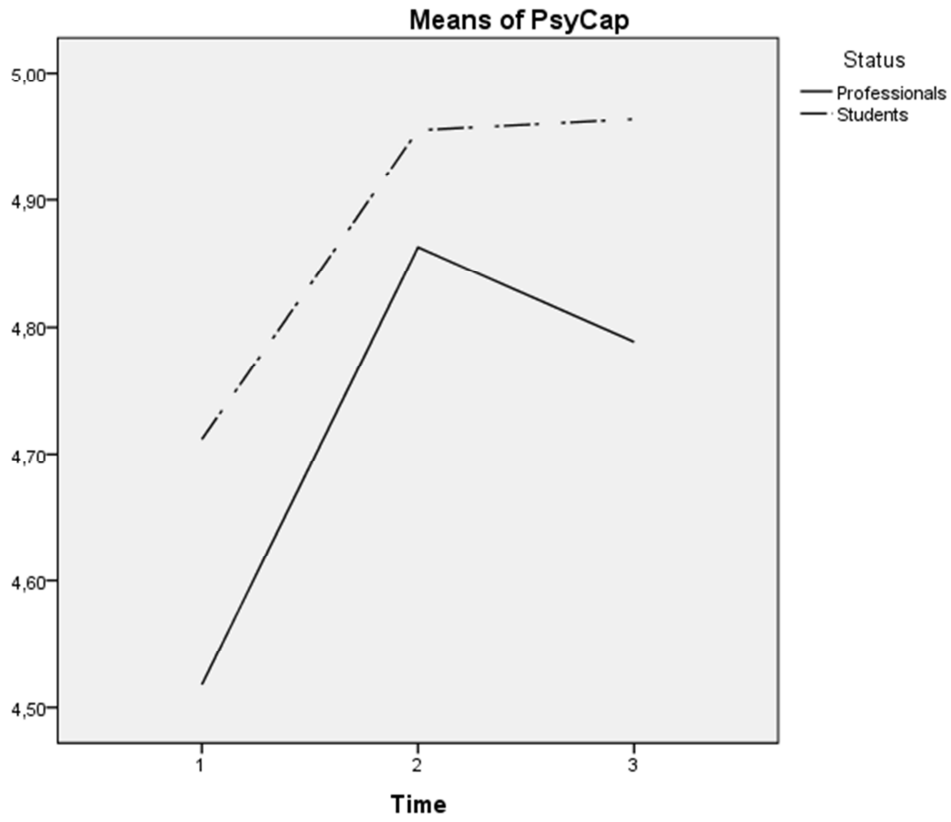

Figure 2 – Development of the four components over time in the two groups