

# LATENT PROFILE ANALYSIS OF PSYCAP

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## **A Person-Centered, Latent Profile Analysis of Psychological Capital**

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### *Abstract*

This inquiry seeks to clarify whether and how various combinations of the four core components of psychological capital (PsyCap)—self-efficacy, hope, optimism and resilience—differentially affect workplace outcomes. To gain such in-depth understanding, this study undertakes a person-centered, latent profile analysis of PsyCap. Several distinct PsyCap component profiles emerge and remain consistent across two studies; these profiles in turn exert significantly different effects on work engagement and job performance. Compared with a more commonly used variable-centered approach, this person-centered approach represents a valuable complement that can expand the understanding and implications of PsyCap.

**JEL classification:** M10, M19

**Keywords:** psychological capital, person-centered research, latent profile analysis, work engagement, job performance

## 1. Introduction

Psychological capital (PsyCap) is a personal resource that can explain the emergence of many important employee attitudes, behaviors and performance. The term was coined by Luthans et al. (2007a), who define it as “an individual’s positive psychological state of development that is characterized by (1) self-efficacy, (2) optimism, (3) hope, and (4) resiliency” (Luthans et al., 2007b, p. 3). Since its introduction, it has attracted burgeoning interest in management research (Avey et al., 2011; Luthans et al., 2015; Newman et al., 2014), yet notwithstanding insights into how PsyCap can enhance various work attitudes and behaviors, some important questions have been raised about measures and statistical analyses of PsyCap by an Australian team of scholars led by Sarah Dawkins (Dawkins et al., 2013). Specifically, a common technique to analyze the effects of PsyCap identifies separate main effects, along with the additive effects, of its core components on different attitudinal and behavioral variables (Newman et al., 2014). An implicit assumption underlying such variable-centered analyses is that the four components that constitute PsyCap each have equal impacts (Furr and Bacharach, 2008). But this assumption has not been sufficiently tested, implying that a variable-centered additive approach may obscure the unique variance explained by specific *combinations* of the four components (Dawkins et al., 2013).

Building on Dawkins et al.’s (2013) observations that current PsyCap research ignores unique combinations or configurations of the four core components, and their possible impacts on work behaviors (e.g., Avey et al., 2010a ; Bissessar, 2014; Nguyen and Nguyen, 2012), we argue that people hold different combinations of *gain*-oriented resources (i.e., self-efficacy, hope and optimism) that are crucial for building the momentum required for goal achievement and

*loss*-oriented resources (i.e., resilience) that act as defense mechanisms against potential resource losses (Hobfoll, 2001; Llorens et al., 2007). For example, a person who has not succeeded in implementing a new project may continue to exhibit self-efficacy, hope and optimism, because he or she previously has developed strong resilience by managing similar projects in the past. Another person may be confident, hopeful and optimistic that she or he will excel at implementing the same project but lack resilience, because she or he has never faced setbacks before. These examples suggest that different configurations of PsyCap may exist. To investigate such a possibility, we propose a person-centered approach as a viable complement to the variable-centered perspective (Morin et al., 2015). With a person-centered perspective, we can explore the presence of distinct subpopulations of PsyCap configurations that differentially combine gain-oriented and loss-oriented resources. Moreover, by identifying different configurations of PsyCap, we can gain new insights into how these profiles relate to distinct outcomes.

For this uncharted territory of PsyCap research, we seek to make two main contributions. First, with our proposed person-centered approach, we identify how subpopulations of employees distinctly combine gain-oriented resources (i.e., self-efficacy, optimism and hope) and loss-oriented resources (i.e., resilience). This specification in turn enables us to investigate the different ways that specific PsyCap configurations relate to work outcomes with a latent profile analysis (Muthen 2000; Vermunt, 2010). The person-centered approach, as an alternative to the variable-centered approach, thus contributes to further conceptual development of PsyCap research. Second, applying a person-oriented approach has significant practical merit, in that it closely mirrors the unique mindsets of various people. For example, managers may tend to view their employees' attitudes and behaviors as combinations

or profiles of characteristics, rather than as differences across a series of variables. The insights that emerge from a person-centered perspective thus should be useful for management practice, by helping managers more readily, accurately and naturally assess employees' PsyCap. For example, managers might gain insights into how different types of employees, defined according to the four PsyCap components, are likely to behave or perform in the workplace; such insights cannot be attained directly from a variable-centered approach.

We therefore offer a brief introduction of the PsyCap concept and an overview of the variable-centered approach traditionally used to study it, including both its strengths and its limitations. Drawing from a conservation of resources (COR) framework (Hobfoll, 1989, 2002), we then build a case for different PsyCap profiles (study 1) and assess how these profiles might relate to two important organizational outcomes: work engagement and job performance (study 2). Finally, we conclude with a discussion of our findings, some study limitations and key implications.

## **2. Literature review**

### *2.1 Psychological capital*

The PsyCap concept comprises four positive psychological resources: self-efficacy, hope, optimism and resilience. Self-efficacy refers to “the conviction or confidence one has about his/her abilities to mobilize the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context” (Stajkovic and Luthans, 1998: 66). It entails a willingness to expend significant effort in pursuit of a successful result, due to positive expectancy about the returns on this effort (Page and Donahue, 2004). Hope is a positive motivational state, derived from the combination of significant investments of goal-directed energy and effective pathways to meet goals (Luthans et al., 2008c; Snyder et al., 1991). Similar

to self-efficacy, hope is based on an expectation of positive outcomes, but whereas this expectation reflects a belief in one's own abilities in the case of self-efficacy, it stems from willpower (i.e., taking motivated action) and waypower (i.e., generating alternative pathways) to produce hope. Optimism, the third positive psychological resource, is also proactive in nature and capitalizes on the positive impact of favorable events. Optimistic people "expect good things to happen to them," irrespective of their perceived abilities (Carver and Scheier, 2002: 231), willpower or waypower (Page and Donahue, 2004). Finally, resilience captures the "psychological capacity to recover from adversity, uncertainty, conflict, failure, or even positive change, progress and increased responsibility" (Luthans, 2002: 702). It is different from the other PsyCap components, in that it implies an ability to rebound from previous or present unfavorable events or stressors, and it helps maintain the status quo (Page and Donahue, 2004). Prior research suggests that each of these components is conceptually distinct (Bandura, 1997; Luthans and Jensen, 2002; Snyder, 2002); empirical evidence also confirms their discriminant validity (Alarcon et al., 2013; Magaletta and Oliver, 1999).

## *2.2. Variable-centered PsyCap research: Issues and potential solutions*

Scholars typically assess the independent effects of the second-order construct PsyCap on different outcomes using a variable-centered approach (Avey et al., 2011; Dawkins et al., 2013; Newman et al., 2014). Variable-centered analyses (i.e., correlation and regression) emphasize the additive linear effects of these four components on different work outcomes, but they ignore their potential combinations, in novel and unique forms, that also might shape work outcomes (Dawkins et al., 2013). Although interaction effects can model combinations of the four resources in variable-centered analyses, such an analytic approach fails to detect the existence of

distinct subgroups that exhibit unique PsyCap configurations, especially if a subgroup contains a relatively small number of members (Gabriel et al., 2015).

To identify new subgroups of PsyCap configurations, we propose a person-centered approach, which treats individual members in a holistic fashion and considers their *membership* in particular subgroups of PsyCap component combinations as a variable with meaning on its own. It thus provides an analytical lens to answer questions, such as, Are there profiles that are more or less beneficial in terms of performance and work engagement? How prevalent are people who score, for example, low on resilience and moderate on self-efficacy, hope and optimism, or who score high on all four PsyCap resources? As the first study to apply a person-centered approach to the study of PsyCap, we lack specific guidelines to forecast which profiles might emerge (Morin et al., 2011). However, we draw on COR theory (Hobfoll, 1989, 2002) to investigate the different PsyCap profiles that might exist, as well as their relationships with two critical work outcomes.

### *2.3. Conservation of resources theory: Gain-oriented and loss-oriented resources*

According to COR theory, people's willingness to engage in energetic activation is a critical element of their efforts to pursue positive actions. This energetic activation in turn is a function of the resources that they possess (Hobfoll, 1989, 2002; Wright and Hobfoll, 2004). For example, when people can rely on their personal resources, they likely have sufficient energy available to deal with work demands. Hobfoll (2002) defines resources as any elements that are valued in their own right (e.g., self-esteem, optimism, health) or that provide means to obtain such centrally valued ends (e.g., close relationships, extrinsic inducements).

A key principle of COR theory is that individual applications of resources require continuous resource replenishment, so people can ensure that their resource reservoirs are not

depleted over time, which limits their energetic activation (Hobfoll, 1989, 2011). In this continuous process of resource building and investments, people may operate less effectively if they fail to regain resources after their substantive resource investments (Hobfoll, 2002). For example, if people devote their positive psychological resources to dealing with challenging job conditions, but fail to attain adequate returns on these investments, they may become more protective against further resource losses. Thus, COR theory differentiates two mechanisms that describe how resources can lead to workplace success: (1) a goal to *gain* new resources that can be used toward energetic activation (Hobfoll, 1989, 2002, 2011) and (2) a propensity to prevent resource *losses* and retain a sufficient buffer of current resources (Hobfoll, 1988, 1989, 2001).

Another significant insight in this regard is that resource losses tend to take primacy over the search for resource gains (Hobfoll, 1989). All else being equal, employees' fear of potential resource losses looms larger than their desire for resource gains, because the former constitutes a fundamental threat to their ability to survive and cope with their daily work challenges. For example, with regard to work engagement, a scholar might have had a series of papers rejected, causing some loss of resilience, which in turn leads to less confidence (i.e., self-efficacy) and reduced positive future expectations (i.e., hope and optimism) in relation to subsequent submissions. This process may occur even if the scholar recognizes that confidence and positive expectations are crucial drivers of success.

These mechanisms, of resource gain pursuit and resource loss protection, in turn reflect two types of psychological resources: gain-oriented and loss-oriented (Hobfoll, 2002; Hobfoll et al., 1990). Gain-oriented resources are essential for building the energy required for goal achievement (Hobfoll, 2001; Llorens et al., 2007), but they are less effective at protecting against resource loss. Furthermore, gain-oriented resources tend to act in concert; when one gain-



oriented resource is high, it reinforces other gain-oriented resources. If the scholar in our example learns that the latest paper has been accepted for publication, this news may build confidence (self-efficacy) and beliefs that future papers will get accepted as well (i.e., hope and optimism). In contrast, loss-oriented resources are effective defense mechanisms against resource losses, in that they enable people to bounce back from negative experiences and threats (Block and Kremen, 1996). When loss-oriented resources are low, people's coping ability gets undermined, such that they are less protected against challenging demands and stressors (Demerouti et al., 2004; Hobfoll and Freedy, 1993). According to COR theory, such loss-oriented resources create a safe haven for their gain-oriented counterparts too. For example, the scholar who experiences a rejection after several months of diligent work on a paper that received a revise-and-resubmit decision may continue to exhibit confidence, hope and optimism about future projects, to the extent that she or he has developed strong resilience in dealing with previous setbacks in the process of publishing papers. In summary, we propose that PsyCap comprises both gain- and loss-oriented resources. Whereas self-efficacy, hope and optimism represent positive resources that encourage building new energy, resilience helps maintain the status quo, by enabling the person to recover from unfavorable, adverse or stressful events.

### **3. Study 1: Establishing PsyCap profiles**

In congruence with the person-centered approach used in psychology research (e.g., Gabriel et al., 2015; Kam et al., 2016; Meyer et al., 2012, 2013), this study aims to identify individuals' membership in specific PsyCap profiles, as a variable with meaning by itself, rather than identifying a priori fixed profiles. We argue that if the profiles emerging from the person-centered approach only indicate quantitative differences—that is, distinguish profiles that show increasing levels of each of the PsyCap components—then this approach would have limited

additional value. The usefulness of the person-centered approach depends on its ability to illustrate profiles that consist of more complex qualitative combinations of the PsyCap components (Marsh et al., 2009; Pastor et al., 2007). Using the distinction between gain-oriented resources (i.e., self-efficacy, hope and optimism) and loss-oriented resources (i.e., resilience), we accordingly anticipate that resources do not operate in a positive, linear fashion across individuals but instead combine into profiles that do *not* fit a linear trend (i.e., low, moderate and high profile) of categories.

Following COR theory, all three gain-oriented resources should operate in concert and reinforce one another's effects, but they may be less appropriate for protecting against potential resource losses (Hobfoll, 1989, 2002, 2011). In contrast, resilience should operate uniquely, in that it is oriented toward the past and focused on overcoming resource losses rather than stimulating resource gains. When people exhibit low resilience, they are highly concerned about resource losses, which makes it more challenging for them to enhance the other three resources that are needed for energetic activation (Hobfoll, 1989, 2002). Noting the primacy of resource loss, we predict that people who are well equipped against resource losses may be less likely to invest immediately in developing more gain-oriented resources. Furthermore, we predict that gain-oriented resources can be high, even in the absence of resilience. For example, a doctoral student who is confident, hopeful and optimistic about getting a paper published, but has not faced any major career setbacks thus far, may not have developed resilience. The other three gain-oriented resources then would be high but fragile. By adopting an inductive approach to investigate the PsyCap profiles, we assess the existence of profiles that are quantitatively distinct (e.g., low gain-oriented and loss-oriented resources versus high gain-oriented and loss-oriented

resources) and qualitatively distinct (e.g., low loss-oriented resources but moderate/high gain-oriented resources). Accordingly, we consider the following general research question:

Research Question 1: Do the PsyCap profiles generated by latent profile analysis reflect both quantitative and qualitative differences?

### *3.1. Method*

*3.1.1. Participants and procedure.* We collected data from 171 clerical staff employed in different occupational sectors in Pakistan, including manufacturing (17%), services (29%), banking and finance (22%), not-for-profit (16%), telecommunications (7%), consumer goods (7%) and higher education (2%).<sup>1</sup> Overall, 83 percent of the study participants were men, and their average age was 33 years. Because English is the official language for correspondence in companies and instruction in Pakistani high schools and universities, participants completed an English-language version of the psychological capital measure (PCQ-24, Luthans et al., 2007a, 2007b). Other studies similarly use English-language instruments to conduct research in Pakistan (e.g., Abbas et al., 2014; Raja and Johns, 2010). Of the 400 surveys distributed to employees, we received 171 usable responses, for a response rate of 43%.

With the PCQ-24, we collected data to measure the four core components of PsyCap. Each subscale uses 6-point Likert response anchors (1 = strongly disagree, 6 = strongly agree) and contains six items. The Cronbach's alphas (Table 1) are consistently acceptable, as follows: self-efficacy (.84), hope (.89), optimism (.77), resilience (.73) and PsyCap (.91). To assess the construct validity of the PsyCap scales, we ran a confirmatory factor analysis (CFA) in which we checked the fit of six items in each PsyCap component and then the fit of the four components to the second-order PsyCap measure. The results indicated the excellent fit of the second-order

model ( $\chi^2 = 295.17$ ,  $df = 196$ ; confirmatory fit index [CFI] = .98; root mean residual [RMR] = .03; root mean square error of approximation [RMSEA] = .05).

[Insert Table 1]

*3.1.2. Analytic approach.* Drawing from related person-centered research, we followed a two-step approach to analyze the profiles in the data (Meyer et al., 2012; Morin et al., 2011). In the first step, we conducted latent profile analyses (LPA) in Mplus 7.1 (Muthen and Muthen, 2012) to identify latent PsyCap profiles. Following Nylund et al. (2007), we determined the optimal number of profiles through an iterative process, in which we estimated the two-profile model first, then added successive profiles.

With a series of statistical tests and indices, we also examine the statistical adequacy of the extracted classes (for more elaborated discussions, see Meyer et al., 2012; Morin et al., 2011; Muthen, 2002). First, we consider distribution-free information criteria based on the log likelihood model, including the Akaike (Akaike, 1987) and Bayesian (Schwarz, 1978) information criteria, for which lower values indicate a better fitting model (Rafferty, 1995). Second, according to the sample-adjusted Bayesian information criterion (SABIC) (Sclove, 1987), we select the model with the best fit *and* fewest parameters from among a set of non-hierarchical models. Third, a bootstrapped likelihood ratio test (BLRT) (McLachlan and Peel, 2000) assesses the extent to which a model with  $k$ -profiles provides a better fit than a model with  $k - 1$  profiles. Significant  $p$ -values for the BLRT indicate that a model with  $k - 1$  classes should be rejected in favor of a  $k$ -class model. Previous simulation studies identify SABIC and BLRT as particularly effective for studies with small samples, as is the case here (Nylund et al., 2007). Fourth, we analyze the posterior probabilities associated with each profile to determine whether there were high probabilities that people would belong to the profile to which they were assigned

and low probabilities of them belonging to the other profiles. We also evaluate the profiles generated through LPA with analyses of variance (ANOVAs). With post hoc pairwise comparison tests, we then label the PsyCap profiles.

### 3.2. Results and discussion

According to the guidelines proposed by Nylund et al. (2007), the optimal model included six profiles (SABIC = 3047.14; BLRT = 16.07). In addition to its excellent fit, this six-profile model yielded excellent posterior probabilities for all profiles, with values ranging between .84 and .97.

[Insert Table 2 about here]

To depict this six-profile, person-centered solution, we plot the standard scores for the components of PsyCap across the six profiles in Figure 1. In support of the prediction that PsyCap profiles are quantitatively distinct, the ANOVA reveals significant differences across the different profiles for self-efficacy ( $F(5,165) = 69.45, p < .001$ ), hope ( $F(5,165) = 103.90, p < .001$ ), optimism ( $F(5,165) = 35.17, p < .001$ ) and resilience ( $F(5,165) = 129.29, p < .001$ ).

[Insert Table 3 about here]/[Insert Figure 1 about here]

Using the graph in Figure 1 and post hoc comparisons (Tukey-B test), we also label the observed profiles. From Figure 1, we note that profile 2 earns the lowest scores for self-efficacy, hope, optimism and resilience, so we refer to it as *Low PsyCap*. In contrast, profile 5 features high scores on self-efficacy, hope, optimism and resilience (Figure 1), so we name it *High PsyCap*. Furthermore, we observe a profile with average scores on all PsyCap components (profile 4), which we label *Moderate PsyCap*. A fourth profile (profile 6) takes the label *High/Moderate PsyCap*, because its scores on the four PsyCap components are not as high as those in the High PsyCap profile but are higher than in the Moderate PsyCap profile. In addition,

two other profiles confirm that the PsyCap profiles can be both quantitatively and qualitatively distinct, consistent with Research Question 1. That is, profile 3 exhibits a dominant low score on resilience and low to moderate scores on self-efficacy, hope and optimism. We label this profile *Dominant Low Resilience*. Finally, profile 1, or the *Dominant Low Optimism* profile, reveals a low score for optimism and moderate scores for self-efficacy, hope and resilience.

#### **4. Study 2: PsyCap profiles and work-related outcomes**

With a second study, we seek to replicate the PsyCap profiles observed in study 1 and assess their relationships with two important work-related outcomes: work engagement and (in-role) job performance. The choice to study these relationships is informed by previous literature that shows that employees' psychological resources-in-use have a decisive role in building their strong work engagement and their achievement of good job performance (Avey et al., 2010; Llorens et al., 2007; Sweetman and Luthans, 2010). Noting the distinction between gain-oriented resources (i.e., self-efficacy, hope and optimism) and loss-oriented resources (i.e., resilience), we expect significant differences in work engagement and job performance across the different PsyCap profiles, including those profiles that do *not* exhibit a pattern of steadily increasing levels of the four underlying PsyCap components.

The extent to which employees are strongly engaged in their work and perform well on the job both require significant levels of energetic activation, which is a function of their resources-in-use (Gorgievski and Hobfoll, 2008; Llorens et al., 2007). As employees invest resources in their daily work, they need to replenish their resource reservoirs continuously, because resource investments unaccompanied by resource gains will be detrimental to their continued well-being and performance (Hobfoll, 1989, 2002). In this regard, COR theory points to the critical role of resource *spiral losses*, reflecting the notion that employees who lack the

resources to deal adequately with challenging work situations are not only less able to cope immediately, but their efforts to overcome their resource shortages also further deplete their existing resources. In addition to spiral losses, COR theory suggests that gain-oriented resources work together (Hobfoll, 1989). That is, gain-oriented resources (i.e., self-efficacy, hope and optimism) tend to reinforce one another in their beneficial effects on employee organizational functioning (Hobfoll, 2001, 2011). Consider the synergetic combination of self-efficacy and optimism as an example: When employees' self-efficacy enhances their job performance, they become more optimistic about their ability to perform effectively. However, this reinforcement of gain-oriented resources has less impact when spiral losses are at work (Hobfoll, 1989). When employees are not sufficiently protected against resource losses, their energy goes toward coping with those losses, instead of building up new resources (Gorgievski and Hobfoll, 2008).

Following the logic that the effects of resource losses prevail over those of resource gains (Hobfoll, 1989), we anticipate that PsyCap profiles marked by low resilience (irrespective of the level of the three gain-oriented resources) score lower on work engagement and job performance compared with profiles that score low on any of the three gain-oriented resources. That is, in the absence of resilience, the inability to defend oneself against resource loss looms so large that it overshadows the energetic activation provided by gain-oriented resources. Accordingly, we suggest the following hypothesis:

Hypothesis 1: There are significant differences in work engagement and job performance across profiles, such that profiles characterized by low levels of resilience score lower on work engagement and job performance, irrespective of the levels of gain-oriented resources.

#### *4.1. Method*

*4.1.1. Participants and procedure.* For our second study, we collected data in Ukraine from a sample of professionals working for different organizations across various occupational sectors (government 16%; consulting 8%; IT 18%; financial services 15%; transportation/shipping 15%; tourism 8%; manufacturing 14%; retail 6%). We invited employees to complete a survey with the same psychological capital scale as in study 1 (PCQ-24, Luthans et al., 2007a), as well as a nine-item work engagement scale (UWES-9; Schaufeli et al., 2006). Using a seven-item measure, supervisors rated the participants' in-role job performance (Williams and Anderson, 1991). Of the 275 professionals we solicited, 190 completed the surveys, for a response rate of 69%. These respondents were nearly equally split by gender (51% female) and averaged 36 years of age. We asked 45 supervisors to rate the performance of the responding employees, which allowed us to match employee–supervisor pairs. Because the business language in the participating companies was Russian, we translated the English-language measurement scales into Russian and back-translated them into English (Brislin et al., 1973).

*4.1.2. Reliability and construct validity.* Similar to study 1, we found excellent internal consistency for the PsyCap measures, with values greater than .70 (Table 1). For work engagement, we averaged the nine items to calculate an overall work engagement score. The Cronbach's alpha was .94. Finally, we averaged the seven items to calculate a composite job performance score, which yielded adequate scale reliability ( $\alpha = .74$ ).

Next, we assessed the construct validity of the study measures by running a CFA that included the four PsyCap components, the second-order PsyCap construct, work engagement, and job performance ( $\chi^2 = 3,548.26$ ,  $df = 626$ ;  $CFI = .92$ ;  $RMR = .05$ ;  $RMSEA = .07$ ). We also examined the discriminant validity of PsyCap with regard to work engagement and job



performance, relying on the procedure discussed by Anderson and Gerbing (1988). That is, we compared the fit of the unconstrained models for both pairs of latent constructs (PsyCap–work engagement and PsyCap–job performance) against the constrained models for the same pairs. We found support for discriminant validity, in that the fit of the unconstrained model for the PsyCap–work engagement pair was significantly better ( $\chi^2 = 962.91$ ,  $df = 402$ ) than the fit of the constrained model ( $\chi^2 = 992.38$ ,  $df = 403$ ), and similarly, the fit of the unconstrained model of the PsyCap–job performance pair was significantly better ( $\chi^2 = 812.88$ ,  $df = 358$ ) than the fit of the constrained model ( $\chi^2 = 887.55$ ,  $df = 359$ ).

*4.1.3. Analytical approach.* Similar to study 1, we followed Nylund et al.'s (2007) guidelines and two-step approach to determine the PsyCap profiles. To test hypothesis 1, we undertook one-way analyses of covariance (ANCOVAs), followed by post hoc comparisons, in which the profile groups were the independent variables, age and gender were covariates, and work engagement and job performance represented the criterion variables. To demonstrate that a person-centered approach offers a value-added alternative to traditional variable-centered analyses of PsyCap, we also used hierarchical regression analysis to test whether a person-centered approach explains additional variance over and above a variable-centered approach in predicting work engagement and job performance. To this end, we compared nested models to determine whether a model that included dummy-coded variables of the profiles (produced by Mplus) explained a significant amount of variance in work engagement and job performance, beyond the variance explained by a model that only includes the second-order construct PsyCap. Finally, following Meyer et al. (2013), we compared models that included PsyCap profiles with a model that included PsyCap interactions. If our person-centered approach is relevant, the model with the linear interactions should not explain additional variance after controlling for PsyCap,

whereas replacing these interactions by our PsyCap profiles should explain additional variance. The latter finding would indicate that work engagement and performance are influenced by the specific type of individual (i.e., the PsyCap profile to which he or she belongs)—an insight that cannot be captured by linear interaction effects in the variable-centered approach.

#### 4.2. Results and discussion

*4.2.1. PsyCap profiles.* Table 2 indicates that a seven-profile model is superior to a six-profile model (SABIC = 1686.71; BLRT = 26.28). The posterior probabilities of belonging to the assigned profile are excellent, with values ranging between .72 and .98. The ANOVA results (Table 3) indicate significant differences for self-efficacy ( $F(6,183) = 46.08, p < .001$ ), hope ( $F(6,183) = 69.15, p < .001$ ), optimism ( $F(6,183) = 206.33, p < .001$ ) and resilience ( $F(6,183) = 173.53, p < .001$ ). As we depict in Figure 2 and Table 3, study 2 replicates the six profiles (i.e., Low PsyCap, High PsyCap, Moderate PsyCap, High/Moderate PsyCap, Dominant Low Resilience, and Dominant Low Optimism) from study 1, but it also adds one profile that is unique to study 2, which we label *Low/Moderate PsyCap* to reflect its scores on the four components, which fall between the Low PsyCap and Moderate PsyCap profiles. In summary, on the basis of the LPA, we identify seven PsyCap profiles, six of which are consistent across two independent studies. The relative robustness of the profiles supports the parsimony of the obtained LPA profiles and their generalizability. Furthermore, two profiles, replicated in both studies (i.e., Dominant Low Resilience and Dominant Low Optimism), do not reflect steadily increasing levels of the four underlying PsyCap components, in support of the notion that PsyCap profiles can be both quantitatively and qualitatively distinct.

*4.2.2. Relationship with outcome variables.* With one-way ANCOVAs, we find that work engagement varies significantly across the seven profiles ( $F(6, 183) = 4.57$ , Mean Squared Error

= 278.20,  $p < .001$ ). Post hoc pairwise comparisons (Table 4) indicate that the Low PsyCap profile features lower levels of work engagement than the Moderate PsyCap, High/Moderate PsyCap or High PsyCap profiles. Moreover, people with a Dominant Low Resilience profile exhibit less work engagement than those that enter the Moderate PsyCap, High/Moderate PsyCap and High PsyCap profiles. Yet we find no significant differences between the Dominant Low Resilience profile on the one hand and the Low PsyCap, Low/Moderate PsyCap and Dominant Low Optimism profiles on the other. Finally, the High PsyCap profile exhibits the highest level of work engagement, significantly different from all other profiles. These results provide partial support for Hypothesis 1, in that the two profiles with the lowest scores on resilience (Dominant Low Resilience and Low PsyCap) also exhibit the lowest scores on work engagement.

[Insert Table 4 about here]

The one-way ANCOVAs also reveal significant overall differences across profiles with regard to job performance ( $F(6, 181) = 6.51$ ,  $MSE = .48$ ,  $p < .001$ ). The results of the post hoc analyses in Table 4 indicate some interesting patterns. Although people in the Low PsyCap profile score a bit lower than those in the High PsyCap profile on job performance (4.90 vs. 5.27), the difference is not statistically significant. The Dominant Low Resilience profile scores significantly lower on job performance compared with all six other profiles. We do not detect any significant differences in job performance among the Low PsyCap, Low/Moderate PsyCap, Moderate PsyCap, High/Moderate PsyCap, High PsyCap or Dominant Low Optimism profiles. This finding that the Dominant Low Resilience profile has the lowest score on job performance provides support for Hypothesis 1.

Overall, our findings indicate that the effect of the gain-oriented resources of PsyCap depend on the context created by the loss-oriented resource resilience. That is, job performance is lower when resilience is low and self-efficacy, hope and optimism are moderate (profile 1), compared with when resilience, self-efficacy, hope and optimism are low (profile 2). Meyer et al. (2013) also propose that illustrating the added value of a person-centered approach, beyond that of a variable-centered approach, requires testing three models (see Table 5): a model including PsyCap (model 1), a nested model including model 1 and all interactions with resilience (model 2) and a third model in which the interactions get replaced by the profiles that emerge from the LPA (model 3). In support of the person-centered approach, the model with the interactions does not explain significant variance in either work engagement ( $\Delta R^2 = .04$ ,  $F$ -change = 1.24, ns) or job performance ( $\Delta R^2 = .05$ ,  $F$ -change = 1.53, ns) after controlling for PsyCap. However, the dummy-coded variables that reflect profile memberships, as generated by LPA, collectively explain a significant amount of variance in both work engagement ( $\Delta R^2 = .06$ ,  $F$ -change = 2.53,  $p < .05$ ) and job performance ( $\Delta R^2 = .12$ ,  $F$ -change = 4.47,  $p < .001$ ), over and above the second-order PsyCap construct. These findings provide support for the complementary value of the person-centered approach in relation to the virtually exclusive reliance on a variable-centered approach in previous research.

## **5. General discussion**

Despite widespread use of a variable-centered approach to PsyCap, we show that the additive linear impact of PsyCap's four components (self-efficacy, hope, optimism and resilience) on work outcomes is not always accurate. As an alternative, we propose a person-centered perspective and offer evidence of several unique configurations, comprised of different combinations of the four core components of PsyCap, which add value in terms of refining our

understanding of how PsyCap affects work engagement and job performance. In general, these findings offer strong empirical support for the critical analysis of PsyCap offered by Dawkins et al. (2013) and highlight the need to reconsider existing methods to measure and analyze PsyCap. Our results support the added value of a person-centered approach, beyond the variable-centered approach, but we also emphasize that our findings should not be taken to suggest that the prevailing variable-centered approach should be abandoned or totally replaced by a person-centered perspective. Rather, our study illustrates that both approaches are needed to create a clearer understanding of PsyCap—and potentially other multidimensional constructs too. A variable-centered approach seeks to establish the generalizability of observed relationships among variables sourced from a sample and ascribed to a broader population; the person-centered approach offers a complementary focus on the uniqueness of the observed relationships within subgroups of a particular sample (Morin et al., 2015).

Although our person-centered approach did not explicitly seek to generalize the findings across studies, it is significant to note that, despite the differences between the samples drawn from two diverse countries, we were able to replicate six of seven profiles. Furthermore, though five profiles reflect increasing levels of the four PsyCap components (Low PsyCap, Low/Moderate PsyCap, Moderate PsyCap, High/Moderate PsyCap and High PsyCap), the LPA also supports a more refined differentiation of profiles (Dominant Low Resilience and Dominant Low Optimism<sup>2</sup>) than a simple differentiation of low versus high PsyCap. This finding provides empirical support for the usefulness of the person-centered approach for the analysis of PsyCap.

This study also illustrates that, for work engagement, the lowest scores emerge from two profiles marked by low resilience (Dominant Low Resilience and Low PsyCap). This loss-oriented resource, as well as its combination with a lack of gain-oriented resources (i.e., low

hope, self-efficacy and optimism), represents a major impediment to work engagement. Then for job performance, we find that the Dominant Low Resilience profile scores significantly lower than all other profiles, but we find no statistically significant differences in job performance between the Low PsyCap and High PsyCap profiles. This latter finding is particularly insightful, because it counters variable-centered studies that suggest a positive relationship between PsyCap and job performance (Avey et al., 2011; Luthans et al., 2007a; Newman et al., 2014; Peterson et al., 2011). This lack of a performance difference between the Low PsyCap and High PsyCap profiles, in combination with the finding that the Dominant Low Resilience profile generates the lowest job performance score, suggests that the four components of PsyCap do not necessarily contribute equally to work outcomes. We thus provide initial evidence that the individual components of PsyCap have unique relationships with job performance, an issue that largely gets overlooked with a variable-centered perspective (Rego et al., 2010; Youssef and Luthans, 2007). A person-centered approach, as exemplified in this study, can provide new, additional insights into the nature of PsyCap that cannot be obtained from more traditional, variable-centered perspectives.

### *5.1. Limitations and future research*

A possible drawback of relying on the person-centered approach and LPA is that they cannot always yield profiles that can be replicated in follow-up studies, because these analyses do not focus on generalizability (e.g., Meyer et al., 2012). In a sense, this weakness also can be a strength and a conservative test, to the extent that LPA generates consistent profiles across different studies (e.g., six of our seven profiles). Therefore, LPA is effective in identifying subgroups of profiles within a particular sample; when applied across multiple samples, it can help identify the most commonly occurring profiles. Additional research might investigate the

robustness of the six common profiles we found in various country contexts, distinct from those we covered in this study. The growing interest in the cross-cultural character of PsyCap suggests that cultural populations may provide an important boundary condition that shapes the interactions and combinations of core components of PsyCap. In their meta-analysis, Avey et al. (2011) show that the relationship between PsyCap and its outcomes is not necessarily consistent across different cultural settings. Accordingly, research on PsyCap profiles should expand beyond mainly North American or European perspectives and adopt the fusion approach recommended by Australasian scholars (Ashkanasy, 2013). For example, considering the relatively low power distance exhibited by Australia, employee PsyCap profiles may have greater significance in this culture (Wernsing, 2014).

Another weakness of past PsyCap studies is that they fail to account for within-subject variation, due to their cross-sectional designs (Peterson et al., 2011). We might have adopted a longitudinal design to test for the temporal stability of PsyCap in study 2, but our main focus was on addressing the issue of variation of work outcomes *among* profiles of PsyCap, not to test for the temporal stability of PsyCap.

### *5.2. Implications for theory and practice*

Our attention to PsyCap profiles reflects trends in organizational research toward greater considerations of how individual employees *differ* on key characteristics (Wang and Hanges, 2011). Contrary to a traditional variable-centered approach that seeks to explain relationships among variables, the person-centered approach involves the identification and comparison of homogeneous subgroups within a population. It treats individuals in a more holistic fashion and allows for the possibility that a specific combination of attributes (e.g., four dimensions of PsyCap) might be experienced differently, with unique implications for employees' work

outcomes, when considered in combination instead of individually. Thus, the person-centered approach takes a fundamentally different perspective on the study of intra-organizational phenomena and serves to complement its variable-centered research counterpart (Meyer et al., 2012; Wang and Hanges, 2011).

This study also suggests some evidence-based guidelines for assigning relative weights to the components of PsyCap programs. For example, our study indicates the greater relative importance that should be placed on resilience when encouraging PsyCap development (Dawkins et al., 2013; Luthans et al., 2010), reflecting the finding that low resilience not only thwarts the benefits of the other three PsyCap components but even results in undesirable outcomes, despite the existence of moderate to high levels of the other three components. Similar guidelines could inform selection and performance management programs. Such practical, evidence-based guidelines could be derived for other specific components or profiles of PsyCap too, to highlight which elements should be encouraged or deemphasized.

### *5.3. Conclusion*

Our primary purpose for applying a person-centered approach was to advance understanding and inform the current debate about PsyCap, regarding whether more complex profiles are needed to differentiate among employees and better predict their work outcomes. Our findings support this novel approach, and we hope this study serves as a catalyst for further investigations of the similarities and differences among employees, in terms of the dimensions that underpin their psychological capital. Person-centered LPA can add to and complement the available arsenal of multiple methods research, leading to a better understanding and enhanced applications of psychological capital concepts; it also may offer a complement to other complex,



multidimensional constructs in organizational behavior and human resource management research streams.

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**Table 1***Descriptive Statistics, Studies 1 and 2*

| Study 1: Pakistan<br>(N = 171) <sup>a</sup> | 1                  | 2     | 3     | 4     | 5     |       |       |
|---|--------------------|-------|-------|-------|-------|-------|-------|
| 1.Self-efficacy                             | (.84) <sup>c</sup> |       |       |       |       |       |       |
| 2.Hope                                      | .74                | (.89) |       |       |       |       |       |
| 3.Optimism                                  | .41                | .51   | (.77) |       |       |       |       |
| 4.Resilience                                | .67                | .68   | .47   | (.73) |       |       |       |
| 5.PsyCap                                    | .85                | .89   | .72   | .84   | (.91) |       |       |
| M   | 4.13               | 4.21  | 3.79  | 3.93  | 4.02  |       |       |
| SD  | .54                | .57   | .52   | .48   | .49   |       |       |
| Study 2: Ukraine<br>(N = 190) <sup>b</sup>  | 1                  | 2     | 3     | 4     | 5     | 6     | 7     |
| 1.Self-efficacy                             | (.88)              |       |       |       |       |       |       |
| 2.Hope                                      | .66                | (.90) |       |       |       |       |       |
| 3.Optimism                                  | .66                | .65   | (.84) |       |       |       |       |
| 4.Resilience                                | .62                | .64   | .67   | (.78) |       |       |       |
| 5.PsyCap                                    | .87                | .86   | .86   | .84   | (.92) |       |       |
| 6. Job performance                          | .30                | .36   | .17   | .18   | .30   | (.94) |       |
| 7. Work engagement                          | .51                | .45   | .39   | .32   | .50   | .23   | (.74) |
| M   | 4.80               | 4.94  | 4.18  | 4.18  | 4.40  | 4.84  | 3.87  |
| SD  | .91                | .82   | .84   | .67   | .70   | .75   | .84   |

<sup>a</sup> All values are significant at  $\alpha = .01$

<sup>b</sup> All values  $< .18$  are significant at  $p = .05$ . All values  $\geq .18$  are significant at  $p = .01$ .

<sup>c</sup> Values on the diagonal represent Cronbach's alphas.

**Table 2***Model Fit Statistics*

| <b>Study 1 (N = 171)</b> | <b>AIC</b> | <b>BIC</b> | <b>SABIC</b> | <b>BLRT</b>     |
|--------------------------|------------|------------|--------------|-----------------|
| 2-profile                | 3215.38    | 3256.22    | 3215.06      | 175.21          |
| 3-profile                | 3095.88    | 3152.43    | 3095.43      | 129.51          |
| 4-profile                | 3065.91    | 3138.17    | 3065.34      | 39.97           |
| 5-profile                | 3054.16    | 3142.13    | 3053.47      | 21.75           |
| 6-profile                | 3047.95    | 3151.63    | 3047.14      | 16.07           |
| 7-profile                | 3048.63    | 3168.02    | 3047.69      | not significant |
| <b>Study 2 (N = 190)</b> | <b>AIC</b> | <b>BIC</b> | <b>SABIC</b> | <b>BLRT</b>     |
| 2-profile                | 1839.44    | 1881.66    | 1840.48      | 339.57          |
| 3-profile                | 1787.39    | 1845.83    | 1788.82      | 62.06           |
| 4-profile                | 1747.14    | 1821.83    | 1748.98      | 50.24           |
| 5-profile                | 1710.18    | 1801.10    | 1712.41      | 46.96           |
| 6-profile                | 1699.98    | 1807.13    | 1702.60      | 20.21           |
| 7-profile                | 1683.69    | 1807.08    | 1686.71      | 26.28           |
| 8-profile                | 1682.10    | 1821.72    | 1685.51      | not significant |

Notes: AIC = Akaike information criterion, BIC = Bayesian information criterion, SABIC = sample-adjusted BIC, and BLRT = bootstrapped likelihood ratio test.

**Table 3***Mean Component Scores for Profiles in Studies 1 and 2*

| <b>Study 1</b>                      | <b>N</b> | <b>Self-efficacy</b>                     | <b>Hope</b>                           | <b>Optimism</b>             | <b>Resilience</b>                   |
|-------------------------------------|----------|--|---------------------------------------|-----------------------------|-------------------------------------|
| Dominant Low Optimism (profile 1)   | 5        | -.93                                     | -1.05                                 | -1.69                       | .48                                 |
| Low PsyCap (profile 2)              | 11       | -2.24                                    | -2.25                                 | -.88                        | -1.76                               |
| Dominant Low Resilience (profile 3) | 27       | -.75                                     | -.86                                  | -.35                        | -1.14                               |
| Moderate PsyCap (profile 4)         | 76       | .05                                      | .05                                   | -.28                        | -.06                                |
| High PsyCap (profile 5)             | 7        | 1.14                                     | 1.26                                  | 2.04                        | 2.25                                |
| High/Moderate PsyCap (profile 6)    | 45       | .83                                      | .90                                   | .77                         | .81                                 |
| Post-hoc comparisons                | 171      | 2 < 1,3 < 4 < 5,6;<br>1=3; 5=6           | 2 < 1,3 < 4 < 5,6;<br>1=3; 5=6        | 1 < 2,3,4 < 6 < 5;<br>2=3=4 | 2 < 3 < 4 < 1,6 < 5;<br>1=6         |
| <b>Study 2</b>                      | <b>N</b> | <b>Self-efficacy</b>                     | <b>Hope</b>                           | <b>Optimism</b>             | <b>Resilience</b>                   |
| Dominant Low Resilience (profile 1) | 13       | -.90                                     | -.42                                  | -.97                        | -2.17                               |
| Low PsyCap (profile 2)              | 10       | -1.54                                    | -2.49                                 | -1.79                       | -1.93                               |
| High PsyCap (profile 3)             | 16       | 1.21                                     | 1.21                                  | 1.26                        | 1.22                                |
| Dominant Low Optimism (profile 4)   | 26       | -1.01                                    | -.90                                  | -1.41                       | -.39                                |
| Low/Moderate PsyCap (profile 5)     | 25       | -.45                                     | -.32                                  | .32                         | -.52                                |
| High/Moderate PsyCap (profile 6)    | 80       | .54                                      | .50                                   | .64                         | .57                                 |
| Moderate PsyCap (profile 7)         | 20       | .10                                      | .13                                   | -.61                        | .29                                 |
| Post-hoc comparisons                | 190      | 2 < 1,5 < 6,7 < 3;<br>2=4; 1=4=5;<br>6=7 | 2 < 4 < 1 < 6,7 < 3;<br>1=5; 5=7; 6=7 | 2 < 4 < 1 < 7 < 5 < 6 < 3   | 1 < 4,5 < 6,7 < 3;<br>1=2; 4=5; 6=7 |



**Table 4***Means for Work Engagement and Job Performance, Study 2 Profiles*

|                                     | <b>Work Engagement</b>               | <b>Job Performance</b> |
|-------------------------------------|--------------------------------------|------------------------|
| Dominant Low Resilience (profile 1) | 3.05                                 | 3.83                   |
| Low PsyCap (profile 2)              | 3.39                                 | 4.90                   |
| High PsyCap (profile 3)             | 4.82                                 | 5.27                   |
| Dominant Low Optimism (profile 4)   | 3.56                                 | 4.84                   |
| Low/Moderate PsyCap (profile 5)     | 3.58                                 | 4.67                   |
| High/Moderate PsyCap (profile 6)    | 4.07                                 | 4.98                   |
| Moderate PsyCap (profile 7)         | 3.88                                 | 4.83                   |
| Post-hoc comparisons                | 1 < 6,7 < 3<br>1=2=4=5;<br>2=4=5=6=7 | 1 < 2,3,4,5,6,7        |

**Table 5***Additional Variance Explained by the Interaction and Profiles Models*

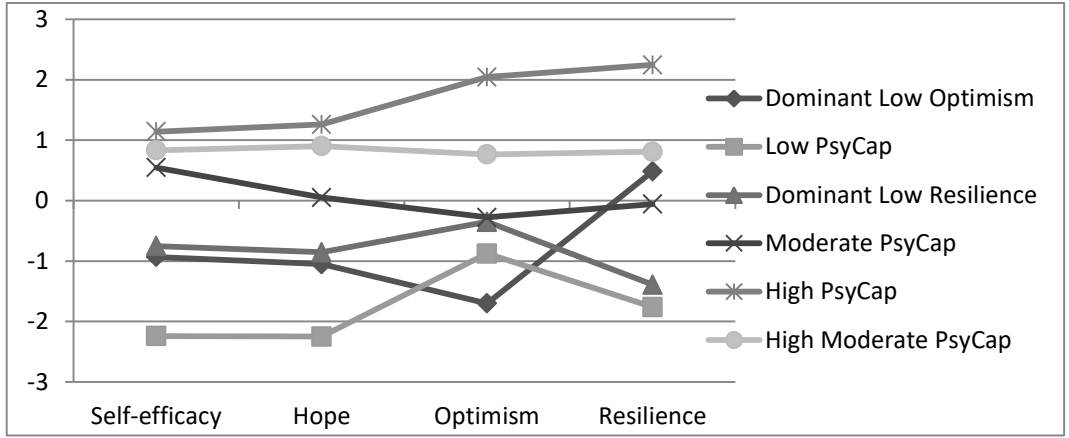
|  | DV: Work Engagement  |              | DV: Performance      |              |
|--|----------------------|--------------|----------------------|--------------|
|  | Total R <sup>2</sup> | $\Delta R^2$ | Total R <sup>2</sup> | $\Delta R^2$ |
| Model 1 (Age + Gender + PsyCap)  | .23                  |              | .12                  |              |
| Model 2 (model 1 + SxR, HxR, OxR, SxHxR, SxOxR, HxOxR, SxHxOxR)                              | .27                  |              | .17                  |              |
| Model 3 (model 1 + dummies for profiles 2,3,4,5,6 and 7 with profile 1 as a reference group) | .29                  |              | .24                  |              |
| Model 1 vs Model 2   |                      | .04 (ns)     |                      | .05 (ns)     |
| Model 1 vs Model 3   |                      | .06*         |                      | .12***       |

Notes: S = self-efficacy, H = hope, O = optimism, R = resilience. All interactions (model 2) and profiles (model 3) were entered simultaneously. To check for the effects of collinearity in models 2 and 3, we examined the condition indices (CI) (Belsley et al., 1980) and variance inflation factors (VIF) (Hair et al., 1995). All CIs were less than 20, and VIFs were less than 10, so collinearity is not a concern.

\* $p < .05$ , \*\*\* $p < .001$ .

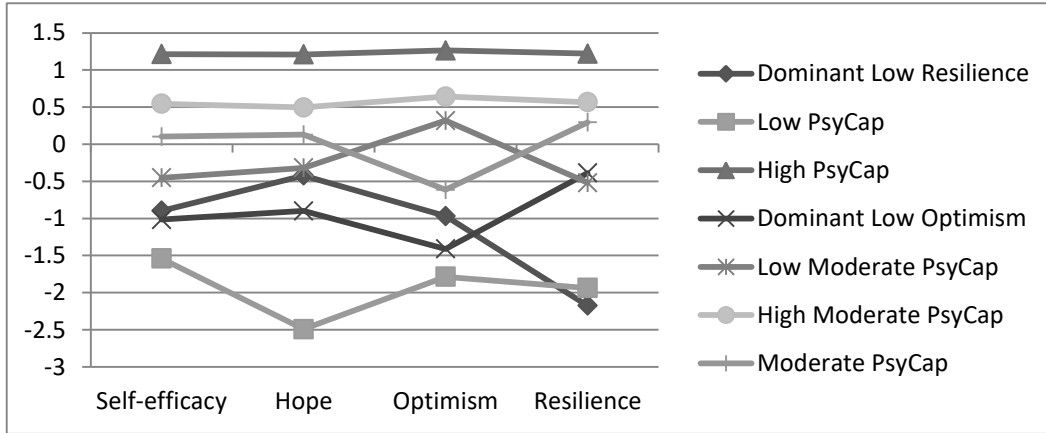
**Figure 1**

*Latent Profiles of Four PsyCap Components, Study 1 (standard scores)*



**Figure 2**

*Latent Profiles of Four PsyCap Components, Study 2 (standard scores)*



### Footnotes

<sup>1</sup> The data used for the person-centered analysis of PsyCap in study 1 came from a completely different, earlier study that explored the relationship of ethical leadership with goal congruence and PsyCap using a variable-centered analysis.

<sup>2</sup> Although we find different resilience scores for the Dominant Low Optimism profiles across the two studies (moderate in study 1 versus moderate/low in study 2), Figures 1 and 2 indicate that the patterns of the four PsyCap components are similar.