Testing a dynamic model of the impact of psychological capital on work engagement and job performance

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Abstract

Purpose – Psychological Capital (PsyCap), consisting of hope, efficacy, resilience, and optimism, is a positive state associated with attitudes, behaviors and performance. The purpose of this paper is to investigate a dynamic mediational model posing work engagement as the mediator of the longitudinal relation between PsyCap and job performance.

Design/methodology/approach – Data came from all white collar employees who responded to this study's variables ($n = 420$) from a comprehensive data set drawn from a large communications service company over two consecutive years. Job performance was rated at the end of each year by the direct supervisor as part of the organizational appraisal system.

Findings – Structural equation modeling analysis found that both absolute levels and increases in PsyCap predicted subsequent work engagement increases which in turn predicted job performance increases. Moreover, the mediating role of the changes in work engagement between previous PsyCap and performance change was confirmed over time.

Research limitations/implications – There is much to gain in conceptualizing the relations among PsyCap, work engagement and job performance as dynamic, rather than static. The results support the conservation of resources theory, in which employees are motivated to acquire, protect and foster their valued (psychological) resources to attain successful performance outcomes, in order to create a gain cycle of resources (Salanova *et al.*, 2010). Moreover, it provide further empirical validation for the idea that processes, like work engagement, are sustained by personal resources, and that these latter exerts mostly an indirect effect on organizational behavior outcomes (Xanthopoulou *et al.*, 2009b).

Practical implications – These results are important from a practical point of view, because they point to the importance of training interventions aimed at developing and sustaining PsyCap as an important determinant of workers' motivation and behavior within the organization. Considerable literature offers practical insights and guidelines for developing PsyCap (Luthans *et al.*, 2006, 2015; Luthans and Youssef-Morgan, 2017).

Originality/value – Despite the demonstrated state-like, dynamic nature of PsyCap, its relationship with performance has mainly been statically analyzed and the role of possible mediating mechanisms largely ignored. This study begins to fill this research gap by investigating the dynamic nature of PsyCap in relation to work engagement and job performance and whether over time engagement mediates the relationship between PsyCap and job performance.

Keywords Work engagement, Psychological capital, Job performance, Latent change model, Mediational model

Paper type Research paper

Psychological Capital (PsyCap) or simply PsyCap, represents an individual's state of development of the combined positive psychological resources of hope, efficacy, resilience and optimism (Luthans, Avolio, Avey and Norman, 2007; Luthans, Youssef and Avolio, 2007). Whereas previous research clearly demonstrates PsyCap predicts desired work outcomes,

with but very few exceptions (e.g. see Peterson *et al.*, 2011), the studies have utilized a static approach and have not answered the call for dynamic, longitudinal analysis (see Avey *et al.*, 2008). Yet, a basic tenet of PsyCap is its dynamic nature and malleability: PsyCap is by definition a "developmental state," open to change and has been shown to be developed through targeted training interventions (Luthans *et al.*, 2010; Luthans, Avey and Patera, 2008; Luthans, Norman, Avolio and Avey, 2008). In addition, Newman *et al.* (2014) recent comprehensive review noted PsyCap research has mainly focused on the antecedents and outcomes (such as job performance), rather than on its mediators. To fill this need, in this study the potential mediating role of work engagement on the relation between PsyCap and job performance is tested.

Work engagement is a positive, fulfilling, affective-motivational state of work-related well-being (Bakker *et al.*, 2008) associated with work performance (e.g. Halbesleben and Wheeler 2008). Work engagement fluctuates over time in relation to situational factors and the availability of personal resources such as PsyCap (Xanthopoulou *et al.*, 2009a). This study uses insights from the conservation of resources (COR) theory (Hobfoll, 1989) and the job demands-job resources (JD-R) model (Bakker, 2011) to develop and test a dynamic motivational process model that links PsyCap to work engagement and in turn to job performance. We test the important theoretical premise that the influence of personal resources on valued behavior outcomes is indirect and is mediated by processes like work engagement. As such, workers' positive personal characteristics are conceived as fuel sustaining the motivational process, expressed by work engagement, determining organizational behavior, rather than direct correlates of workers' organizational behavior. More specifically, we investigate if absolute PsyCap levels and changes predict increases in supervisor evaluated job performance over time through the mediation of longitudinal changes in work engagement.

PsyCap
The construct of PsyCap was formulated by Luthans and colleagues (Luthans, 2002; Luthans, Avolio, Avey and Norman, 2007; Luthans, Youssef and Avolio, 2007) and describes the psychological status of an individual characterized by: having confidence (efficacy) to take on and put in the necessary effort to succeed at challenging tasks; making a positive attribution (optimism) about succeeding now and in the future; persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and when beset by problems and adversity, sustaining and bouncing back (resilience) to attain success (Luthans, Avolio, Avey and Norman, 2007; Luthans, Youssef and Avolio, 2007, p. 3).

Over the years, numerous studies have demonstrated that the core construct of PsyCap has a stronger impact than any one or more of the components that make it up (see the meta-analysis of 51 studies by Avey *et al.*, 2011; Luthans, Avolio, Avey and Norman, 2007; Luthans, Youssef and Avolio, 2007 and comprehensive reviews by Dawkins *et al.*, 2013; Newman *et al.*, 2014), and to be related to desired work attitudes, behaviors, and performance (see Avey *et al.*, 2011; Luthans and Youssef-Morgan, 2017; Newman *et al.*, 2014 Peterson *et al.*, 2011), over and above widely recognized demographic characteristics and positive traits such as personality and self-evaluations (Luthans *et al.*, 2015) across western and non-western cultures (Luthans, Avey and Patera, 2008; Luthans, Norman, Avolio and Avey, 2008; Sun *et al.*, 2012). For example, Avey *et al.* (2011) in their meta-analysis found a positive correlation of PsyCap with measures of job performance (0.26 in 24 studies), with organizational citizenship behaviors (0.45 in 8 studies), and with attitudes of satisfaction (0.54, in 10 studies) and commitment (0.48 in 9 studies). They also found a negative correlation of −0.43 (in 7 studies) between PsyCap and measures of counterproductive work behaviors.

A dynamic perspective of PsyCap, work engagement and job performance
An important cornerstone of PsyCap construct is that the construct is malleable and state-like (Luthans, 2002; Luthans, Avolio, Avey and Norman, 2007; Luthans, Youssef and Avolio, 2007) thus it can be expected: to fluctuate over a relatively short period of time around a certain mean level value; but also to show significant changes over time (see Luthans *et al.*, 2010; Peterson *et al.*, 2011). In this regard, previous research has shown that PsyCap as a whole has higher rank-order stability (r about 0.50) than emotional states, but is not as stable as personality or self-evaluation traits (Luthans, Avolio, Avey and Norman, 2007; Luthans, Youssef and Avolio, 2007). Moreover, it has been shown to be developable, at mean-level, through targeted interventions (Luthans *et al.*, 2010; Luthans, Avey and Patera, 2008; Luthans, Norman, Avolio and Avey, 2008). Moreover, a study by Peterson *et al.* (2011) found a small mean level change and a decreasing trajectory of PsyCap over a seven-months period, as a function of situational or contextual variables (such as support, feedback or organizational climate). Thus, in this study, we aim to further contribute to the understanding of the dynamic nature of PsyCap by investigating the extent of its rank-order and mean level stability over a one-year interval, and also the direction of this change (increase or decrease).

The dynamic nature of both work engagement and job performance has been central to several recent studies that have begun to differentiate an enduring level from a momentary (or daily) level of work engagement pointing out a systematic pattern of reliable mean-level temporal fluctuations in the construct (e.g. Bakker, 2014). While more research is still necessary to fully understand the longitudinal dynamic of work engagement, it is reasonable to expect a moderate change of mean level, and moderate rank-order stability for work engagement across a one year span. Recent studies have also reported some evidence for mean-level variability in job performance over time, attesting a moderate degree of rank-order stability with an r of about 0.45 over a one-year time interval (see Alessandri, Borgogni and Truxillo, 2014) and the same for career success (see Cenciotti *et al.*, in press). On the basis of these results, we expect a moderate change in mean level and a moderate level of rank-order stability in job performance.

Drawing from the above, we derived the following hypotheses:

H1a. We expect significant mean level changes in PsyCap, work engagement, and job performance over time.

H1b. We expect moderate rank-order stability in PsyCap, work engagement, and job performance over time.

Relationship between PsyCap and work engagement
The engaged employee is connected to the task and is personally present and fully active in his/her own role (Kahn, 1990). In particular, Schaufeli *et al.* (2002) stressed the importance of three dimensions of engagement – vigor (the willingness to invest energy and effort into the work), dedication (experiencing a sense of significance and pride) and absorption (a state of mind characterized by full concentration and immersion in the work). The JD-R model theorizes that personal resources (similar to PsyCap) have an intrinsic motivational potential able to lead to high work engagement (Lorente *et al.*, 2014). In this regard, empirical studies demonstrated that personal resources protect individuals from demanding situations, and facilitate goals attainments and stimulate growth and development over short time periods (Ouweneel *et al.*, 2012; Xanthopoulou *et al.*, 2009b). Engaged employees are characterized by tenacity and persistence, and are driven by a solid belief in future success (Xanthopoulou *et al.*, 2007, 2009a).

Whereas previous studies have extensively investigated the role of personal resources in the prediction of work engagement, research on PsyCap *per se* and engagement has been limited.

Nevertheless, each of the four PsyCap components has been shown to be conceptually related to work engagement (Sweetman and Luthans, 2010). For example, employees with a sense of mastery in accomplishing work tasks and managing the work context (efficacy) will become more: mentally absorbed in reaching the goal of the work without being distracted (absorption); likely to invest effort in order to produce the expected results (vigor); and strongly identified with what they are doing (dedication) (Sweetman and Luthans, 2010).

In terms of the other PsyCap components, optimists tend to approach work and job challenges expecting to succeed, and this in turn will lead to higher psychological availability (absorption). At the same time, optimists also tend to make internal attributions in the case of success and external attributions in the case of difficulties and failures, decreasing the negative impact of stressful conditions and thus reducing cynicism and fostering dedication. Hope, representing an important psychological resource of PsyCap, expressed by the persistent pursuit of goals and the proactive identification of pathways, may provide the energy (vigor) and willingness (dedication) to reach goals, and also by identifying alternative pathways in case of obstacles (Sweetman and Luthans, 2010). Finally, the PsyCap component of resilience, through positive adaptation to adversities and change, reduces the negative effect of job demands. It enacts resilient behaviors and facilitates bringing their personal selves to the workplace through the three components of work engagement.

According to the JD-R model, individuals with a higher level of PsyCap, having a more positive self-regard, experience a higher level of goal self-concordance (between goals set and capabilities) (Luthans, Youssef and Avolio, 2007) and thus are intrinsically motivated to pursue their goals and consequently to be more engaged. Additionally, drawing from the mechanisms of COR theory (Hobfoll, 1989), PsyCap may be conceived as a psychological resource that fosters work engagement. At the essence of this theory there is the assumption that individuals have a definite level of personal resources which they decide to conserve and expand on the basis of motivational factors (Hobfoll, 1989). The absolute level of personal resources, as observed for a given individual at a specific point in time, is expected to promote the capability to invest in a given situation. Accordingly, one can conceptualize the absolute level of PsyCap (i.e. the absolute score reported by a specific individual at a given point in time) as the gauge of the amount of personal resources an individual has to invest in one's work. Those with high PsyCap may intensify their investment of energy in their work activity and boost their efforts to achieve and become more engaged in their work. Thus, PsyCap would seem to be an important predictor of longitudinal changes in work engagement (e.g. by acting as a facilitator of increases in work engagement). From this perspective, the absolute level of PsyCap can be conceived as a motivational potential that helps in setting the basis for work engagement changes.

Moreover, increases in employees' PsyCap signal an enlarged set of personal resources for workers to draw from and invest in their work. By the same token, a decrease in PsyCap signals a state of relative resource depletion, resulting in the workers withdrawing from their work. Metaphorically, Peterson *et al.* (2011) described the reservoir of PsyCap that employees have as a "bank account" from which workers are continuously depositing to or withdrawing. Increases in the total availability of PsyCap are expected to be refreshing and revitalizing, providing individuals with more resources to invest at work and triggering a spiral of positive gain (Hakanen *et al.*, 2008; Salanova *et al.*, 2010). Therefore, we expect that an employee's increase (decrease) in PsyCap will be related to an increase (decrease) in work engagement.

From the above we drew the following study hypotheses:

H2a. Absolute levels of PsyCap are positively related to absolute levels of work engagement.

H2b. Absolute levels of PsyCap are positively related to changes in work engagement.

H2c. Changes in PsyCap are positively related to changes in work engagement.

Relationship between work engagement and job performance
Extensive research has demonstrated a significant relationship between work engagement
and job performance. For example, work engagement has been correlated with a number of
different objective, subjective and inter-subjective performance indicators, such as in-role
performance (Halbesleben and Wheeler, 2008), sales volume (Xanthopoulou *et al.*, 2009b),
and innovativeness (Hakanen *et al.*, 2008). The explanation that has been given is that job
performance is effective when employees experience a positive and active motivational state
of mind, characterized by the affection (dedication), energy (vigor) and cognitive inspiration
(absorption) toward work. It is this particular psychological condition that motivates
employees to work hard and perform well. Engaged employees approach their work
proactively (Salanova and Schaufeli, 2008), are more dynamic (Bakker and Leiter, 2010),
more responsive to new information and work harder (Bakker and Leiter, 2010).

Therefore, according to the JD-R model, it seems likely that more engaged individuals
will show, across time, higher levels of job performance than individuals characterized by
low levels of work engagement (see Bakker and Bal, 2010). Moreover in line with COR
theory, the absolute level of work engagement may affect the increases of performance over
time, because it is expected that work engagement bound individuals' capability to invest
their efforts in work activities, producing an increase of performance over time. This is
because increases in work engagement signal increased resources to invest at work
(Hobfoll, 1989). Greater involvement and effort spent on the work, in turn, are likely to
predict an increase of job performance.

Therefore, we formulated the following hypotheses:

H3a. Absolute levels of work engagement are positively related to absolute levels of job
performance.

H3b. Absolute levels of work engagement are positively related to changes in job
performance.

H3c. Changes in work engagement are positively related to changes in job performance.

The mediating role of work engagement
According to our dynamic model, PsyCap can be conceptualized as the expression of the
psychological resources corresponding to the amount of potentialities (namely efficacy,
optimism, hope and resilience) owned by the individual. Work engagement expresses a
motivational component, and is represented by the investment of efforts and involvement
that the individual dedicates to work. On the other hand, job performance represents the
behavioral outcome, recognized and valued by the organization. It is through this
motivational process (i.e. boosting work engagement) that potentialities (i.e. PsyCap and
changes in PsyCap) are translated into productive organizational behaviors (i.e. effective
and increased job performance). Thus, we formulated the following hypotheses:

H4a. Changes in work engagement mediates the relationship between the absolute levels
of PsyCap and job performance.

H4b. Changes in work engagement mediates the relationship between changes of
PsyCap and changes of job performance.

Method
Sample
The sample consisted of 420 white collar employees who met the study variables inclusion
criteria from a comprehensive data set gathered over two consecutive years in one of Italy's
largest organizations. All participants worked in line functions and were located in Rome.

In terms of demographics, there were more males (55 percent) than females, with a mean age of about 44.28 (SD = 7.3) years, and an average job tenure of about 15.14 (SD = 10.11) years. Their years of education ranged from 8 to 18; 55 percent earned a university degree, 44 percent completed high school, and 1 percent completed junior high school. The data were hierarchical in nature, with individual-level measures nested within 102 different offices, with a mean team sample size of about 4 people (SD = 4.28).

Procedure
Performance ratings were provided at the end of each year by the Human Resource (HR) department, by way of their performance appraisal system. Survey data on the study measures were gathered through an online questionnaire in the Spring of two succeeding years. The timing of the research was dictated by the HR department, and reflects organizational necessities. In detail, research started in April with the questionnaire administration. Then in December of the same year every supervisor filled the performance appraisal form (referring to the period from January to December); then between January and March this evaluation is communicated to the subordinates through a feedback process. Again in April we organized the second data collection of self-reported measures, and again in December the supervisors were asked to fill out the performance appraisal. Participation in the study was voluntary, and the research team guaranteed confidentiality to the participants.

Attrition. At wave 2, 35 percent of individuals missed data collection. The attrition was mainly due to the unavailability of individuals to take part in this phase of the study, or in some cases, because individuals retired, moved to another job, or simply were absent from work on the days designated for data collection. However, no significant differences were detected in a paired *t*-test between "attritted" participants and the rest of the sample on the major study variables in terms of socio-demographic characteristics, scores on PsyCap and work engagement measures, and job performance. The couple of differences included a higher chronological age of retired participants and a higher proportion of males among participants who resigned. In further analysis the groups did not differ in the covariance matrices as tested by the Box-*M* test for homogeneity of covariance matrices.

Measures
PsyCap. PsyCap was measured with the Italian version of the 24-item PsyCap Questionnaire (PCQ-24; Luthans, Avolio, Avey and Norman, 2007) by Alessandri, Borgogni, Consiglio and Mitidieri (2014). The 24 items that make up the survey were adapted from previously published scales that have been analyzed and supported in the positive psychology literature across multiple studies and have been used in previous workplace studies by themselves and in combination (e.g. Luthans, Avolio, Avey and Norman, 2007). Specifically, the instrument consists of four subscales, assessing, respectively: hope (e.g. "If I should find myself in a jam at work, I could think of many ways to get out of it"), resilience (e.g. "I usually manage difficulties one way or another at work"), optimism (e.g. "I always look on the bright side of things regarding my job"), and efficacy (e.g. "I feel confident helping to set targets/goals in my work area"). Responses were given on a six-point Likert-type scale (1 = strongly disagree; 6 = strongly agree).

α for the subscales were: 0.86 (Wave 1), 0.82 (Wave 2) for Hope; 0.69 (Wave 1), 0.73 (Wave 2) for Efficacy; 0.70 (Wave 1), 0.75 (Wave 2) for resiliency; 0.83 (Wave 1), 0.78 (Wave 2) for optimism. Correlations among subscales ranged at Wave 1, from 0.55 (optimism with resiliency) to 0.71 (efficacy with hope) with a mean of 0.60 (SD = 0.07). At Wave 2, these correlations ranged from 0.51 (optimism with efficacy) to 0.70 (efficacy with hope) with a mean of 0.63 (SD = 0.07). Finally, α for the overall scale were 0.90 at Wave 1 and 0.92 at Wave 2.

Work engagement. Work engagement was measured by the short Utrecht Work Engagement Scale (Schaufeli *et al.*, 2006), which has three subscales: vigor, dedication, and absorption. Vigor (three items; e.g. "At my work, I feel bursting with energy") is defined as having energy and mental resilience while working. Dedication (two items[1]; e.g. "I am proud of the work I do.") is defined as a sense of significance, enthusiasm, inspiration, pride and work-related challenge. Absorption (three items; e.g. "When I am working, I forget everything else around me") is defined as being fully concentrated and happily engrossed in one's work. Item responses were on a seven-point Likert scale ranging from 1 (Never) to 7 (Always).

α for the subscales were: 0.60 (Wave 1), 0.68 (Wave 2) for absorption, 0.70 (Wave 1), 0.83 (Wave 2) for dedication, and 0.83 (Wave 1), 0.86 (Wave 2) for vigor. Subscales were highly correlated with coefficients ranging from 0.74 (vigor with absorption) to 0.81 (dedication with absorption) with a mean of 0.78 (SD = 0.03) at Wave 1, and from 0.67 (vitality with absorption) to 0.87 (dedication with vitality) with a mean of 0.73 (SD = 0.12) at Wave 2. For this study, the composite engagement score was used as suggested by Schaufeli *et al.* (2006). α were 0.95 at Wave 1 and 0.93 at Wave 2.

Job performance. Supervisors rated their employees' performance through the company's established performance appraisal system. This instrument had been developed by the HR department of the organization as a general, unidimensional measure of performance. It was comprised of five behavioral performance-domains, namely "customer focus" (e.g. "He/she anticipates clients needs"); "communication" (e.g. "He/she adjusts his/her communication style to different people"); "network management" (e.g. "He/she builds up constructive relationships in order to achieve common results"); "problem solving" (e.g. "He/she identifies problems correctly and finds appropriate solutions"); and "change management" (e.g. "He/she explores new opportunities that contribute to the ongoing change process"). These were measured on a ten-point scale (labels: 1 = inadequate; from 2 to 3 = improvable; 4-6 = average; 7-9 = elevated; 10 = beyond expectations). The items were defined on the basis of an organizational competency model with the intention to operationalize the organizational expectations on how to perform the job from a top-down approach in line with the firm's distinctive core competencies. All supervisors were trained to evaluate their subordinates using this approach in order to transform such indicators in an accurate and complete evaluation. α were 0.95 at Wave 1 and 0.93 at Wave 2.

Statistical procedures

The data gathered in this study had a multilevel or hierarchical structure, thus in order to determine the extent of between-unit variance in all variables, we computed the Intraclass Coefficient (ICC) and the Design Effect Index (DEF = Muthén and Satorra, 1995). As shown in Table I, the ICC values observed in this study ranged from negligible (i.e. 0.01, 0.02 for PsyCap items and scale score at Wave 1) to moderately high (i.e. 0.11 and 0.20 for job performance items and scale score at Wave 1). According to the standards adopted by other

	(1)	(2)	(3)	(4)	(5)	(6)	Mean	SD	ICC
1. PsyCap_Wave 1	1						5.29	0.62	0.02
2. Work engagement Wave 1	0.53**	1					6.39	0.89	0.02
3. Job performance Wave 1	0.10*	0.13*	1				7.20	0.93	0.20
4. PsyCap Wave 2	0.81**	0.41**	0.13*	1			5.48	0.66	0.03
5. Work engagement Wave 2	0.59**	0.63**	0.12*	0.69**	1		6.59	0.85	0.01
6. Job performance Wave 2	0.11*	0.17**	0.65**	0.15**	0.11*	1	7.66	1.14	0.07

Notes: $n = 420$ at Wave 1, and 273 for Wave 2. *$p < 0.05$; **$p < 0.01$

Table I.
Means, standard
deviation, and zero
order correlations,
intraclass coefficients
(ICC), and design
effect indices (DEF)
for study variables

researchers (e.g. Hox, 2002), these values can be considered an index of a moderate-low grouping effect. This is further corroborated by an inspection of the design effect indices, all below the critical level of 2.

Thus, in performing all subsequent analyses, the presence of dependence of employees' data within offices was taken into account, employing an estimation procedure that "includes a Taylor series-like function to provide a normal theory covariance matrix for analysis" and produces correct parameter estimates under Full Information Maximum Likelihood as implemented in Mplus 7.11 (see Muthén and Muthén, 2012). Model fit was assessed according to the following criteria: χ^2 likelihood ratio statistic, comparative fit index (CFI), and the root mean square error of approximation (RMSEA).The critical value of χ^2 is sensitive to large sample sizes and easily produces a statistically significant result (Kline, 2015). We accepted TLI and CFI values greater than 0.90 and RMSEA values lower than 0.08 (Kline, 2015).

Mediated effects were calculated using the program PRODCLIN2 (MacKinnon, 2008). To compare the fit of the nested models in the measurement invariance sequence, we used the χ^2 difference test ($\Delta\chi^2$) and the difference in the CFI (ΔCFI); as noted by Cheung and Rensvold (2002), a difference larger than 0.01 in CFI indicates a meaningful change in model fit.

Modeling strategies

For investigating the relationship between PsyCap and work engagement absolute level and change on work engagement and job performance changes, we relied on latent change (LC) models (McArdle, 2009). This analysis was performed in two steps. First, we investigated the presence of significant change from Wave 1 to Wave 2, through univariate LC models. Second, we fitted a multivariate LC model assuming the proposed flow of relations among constructs.

To ensure that changes at the latent level were not due to changes in the relationship between manifest indicators and the latent variable of job performance, we tested our measures for measurement invariance (Meredith, 1993). As Meredith (1993) has argued, there are different levels of invariance. For our purposes, two levels of invariance were required. First, configural invariance, which hypothesizes the equality of the overall structure (i.e. the same factor and same patterns of fixed and freed parameters) across time or groups; and second, metric invariance, which hypothesizes the equality of the factor loadings across time or groups.

Measurement invariance model. First, for each construct separately, we specified a measurement model at Wave 1 and at Wave 2, including two correlated latent factors, one for the first (Wave 1) and the other for the second measurement (Wave 2). In both years: PsyCap was measured with four parcels per year, each representing one of the components of the construct (i.e. hope, efficacy, resiliency, and optimism); work engagement was measured with three parcels per year, each representing one of the components of the construct (i.e. vigor, dedication, and absorption); and job performance was measured with five items per year. Residuals of corresponding manifest variables were allowed to correlate over time to account for effects not due to the factors of interest. The variance for each latent factor was initially set to 1 to standardize the latent factor, the five loadings were freed, and the correlation between the two latent factors was estimated.

We then proceeded with tests of measurement invariance (see Meredith, 1993) by first constraining loadings at Wave 1 to be equal to the item loadings at Wave 2 (Model 2, weak invariance), and then intercepts at Wave 1 to be equal to the corresponding item intercept at Wave 2. Given constraints imposed on latent factors variances and means, the estimated mean for the latent factor at Wave 2 can be interpreted as the standardized change relative to Wave 1.

LC model. First, to analyze mean-level changes in PsyCap, work engagement, and job performance we built a series of univariate LC models (McArdle, 2009). These focus on the LC

model which in turn focuses on intra-individual change and individual differences within the individual change. We changed measurement model parameterization, fixing a first order loading to 1 and the corresponding intercept to 0 (rather than factor mean and variance, see previous section). With respect to the previous measurement model, this LC model additionally included a latent intercept factor (I) and a latent slope factor (S). The latent intercept factor was fixed to 1 at each measurement point (Wave 1 and Wave 2) and reflected the absolute level of PsyCap, work engagement, or job performance at the first time of measurement. The latent slope factor was fixed to 0 in the first Wave and fixed to 1 in the second Wave and reflected the amount of mean-level change in each construct.

Multivariate LC model. To test the hypothesized direct and indirect influences of PsyCap on work engagement and job performance, we implemented a multivariate LC models, using the slope of work engagement as the putative focal mediator (Cheong *et al.*, 2003). In this model, the intercept of all variables were posited as correlated, since they represent cross-sectional relationships among constructs. In addition, we regressed the slopes of the mediator and the outcome on the intercepts. We did this in order to adjust each direct path for the potential biasing effect of absolute mean level differences on each construct at Wave 1 on the observed change (Cheong *et al.*, 2003).

Finally, we specified: a direct effect of PsyCap intercept on the slope of work engagement (path a); a direct effect of PsyCap slope on the slope of work engagement (path b); a direct effect of the intercept of work engagement on the slope of job performance (path c); and a direct effect of the slope of work engagement on the slope of job performance (path d). The product of path a × path d represents the indirect effect of the absolute level of PsyCap at Wave 1, on the observed change in job performance from Wave 1 to Wave 2 through changes in work engagement. Likewise, the product of path b × path d represents the indirect effect of the observed change of PsyCap from Wave 1 to Wave 2, on the observed change in job performance from Wave 1 to Wave 2 through changes in work engagement.

Results
Relationships among variables and across waves
Table I contains the zero-order correlations among PsyCap, work engagement, and job performance within and across time. As expected, positive and significant correlations among all variables revealed that individuals high in PsyCap tended to be more engaged in their work, and resulted in better job performance at both times.

Measurement model
The first step in our analyses was to establish measurement invariance. As described earlier, we accomplished this goal by testing a series of increasingly restrictive models.

PsyCap. The model fit the data at each time point (1) Wave 1: $\chi^2(2) = 6.50$, $p < 0.05$, CFI $= 0.968$, RMSEA $= 0.073$ (0.051, 0.094); Wave 2: $\chi^2(2) = 5.98$, $p = 0.051$, CFI $= 0.971$, RMSEA $= 0.069$ (0.050, 0.088). Hope ($\lambda_{w1} = 0.87$, $\lambda_{w2} = 0.92$), efficacy ($\lambda_{w1} = 0.81$, $\lambda_{w2} = 0.75$), resiliency ($\lambda_{w1} = 0.73$, $\lambda_{w2} = 0.77$), and optimism ($\lambda_{w1} = 0.74$, $\lambda_{w2} = 0.74$), loaded strongly and significantly on the latent PsyCap factor at both Wave 1 and Wave 2. Configural ($\chi^2(15) = 33.69$, $p < 0.05$, CFI $= 0.986$, RMSEA $= 0.055$ (0.043, 0.065)), metric ($\chi^2(18) = 42.47$, $p < 0.05$, CFI $= 0.988$, RMSEA $= 0.057$ (0.035 −0.078), and scalar metric ($\chi^2(21) = 50.58$, $p < 0.05$, CFI 0.992, RMSEA $= 0.058$ (0.036, 0.079) invariance were supported (configural vs metric: $\Delta\chi^2(3) = 8.78$, $p = 0.03$; ΔCFI $= 0.002$; metric vs scalar: $\Delta\chi^2(3) = 8.11$, $p < 0.05$; ΔCFI $= 0.004$). The standardized mean difference from Wave 1 to Wave 2 was 0.127 ($t = 2.756$), suggesting a small increase in PsyCap during the period examined. The latent rank-order stability (r), calculated as the latent test–retest correlation was 0.82 ($t = 30.58$), suggesting a high rank-order stability.

Work engagement. With only three items, the work engagement measure resulted in a saturated model when considered from a single-time point perspective. Configural ($\chi^2(4) = 6.90$, $p = 0.14$, CFI = 0.996, RMSEA = 0.042 (0.00, 0.042)), metric ($\chi^2(6) = 8.47$, $p = 0.20$, CFI = 0.995, RMSEA = 0.031 (0.00 −0.076), and scalar metric ($\chi^2(8) = 11.93$, $p = 0.18$, CFI 0.997, RMSEA = 0.034 (0.015, 0.053) invariance were supported configural vs metric: $\Delta\chi^2(2) = 1.57$, $p = 0.46$; ΔCFI = 0.001; metric vs scalar: $\Delta\chi^2(2) = 3.45$, $p = 0.18$; ΔCFI = 0.002). Vigor ($\lambda_{w1} = 0.79$, $\lambda_{w2} = 0.85$), absorption ($\lambda_{w1} = 0.81$, $\lambda_{w2} = 0.64$), and dedication ($\lambda_{w1} = 0.87$, $\lambda_{w2} = 0.89$), loaded strongly and significantly on the latent work engagement factor at both Wave 1 and Wave 2. The standardized mean difference from Wave 1 to Wave 2 was 0.081 ($t = 1.967$), suggesting a small increase in work engagement during the period examined. The latent rank-order stability was 0.66 ($t = 10.36$), suggesting a moderate-high rank-order stability.

Job performance. The model fit the data at each time point (1) T1: $\chi^2(4) = 10.63$, $p < 0.05$, CFI = 0.998, RMSEA = 0.043 (0.012, 0.075); T2: $\chi^2(4) = 9.80$, $p < 0.05$, CFI = 0.997, RMSEA = 0.054 (0.008, 0.099). All the five items loaded strongly and significantly on the latent job performance factor at both Wave 1 and Wave 2, with a mean loading of 0.85 (SD = 0.04). Configural ($\chi^2(27) = 101.61$, $p < 0.05$, CFI = 0.986, RMSEA = 0.054 (0.043, 0.065)), metric ($\chi^2(31) = 104.77$, $p < 0.05$, CFI = 0.987, RMSEA = 0.051 (0.039 −0.060), and scalar metric ($\chi^2(35) = 132.35$, $p < 0.05$, CFI 0.982, RMSEA = 0.054 (0.044, 0.064) invariance were supported by all fit indices (configural vs metric: $\Delta\chi^2(4) = 3.18$, $p = 0.83$; ΔCFI = 0.001; metric vs scalar: $\Delta\chi^2(4) = 27.63$, $p < 0.05$; ΔCFI = −0.005). The standardized mean difference from Wave 1 to Wave 2 was 0.079 ($t = 1.967$), suggesting a small increase in job performance during the period examined. The latent rank-order stability was 0.45 ($t = 10.45$), suggesting a moderate rank-order stability.

Univariate LC models
As a preliminary step to the analyses, we fit an unconditional LC model for each variable separately. For PsyCap, this model fit the data very well, $\chi^2(28) = 72.81$, $p < 0.01$, CFI = 0.969, RMSEA = 0.062 (0.043, 0.081). The mean coefficients for the intercept (5.29; $t = 151.89$) and slope (0.118, $t = 1.971$) were significant. Likewise, the intercept (0.38, $t = 151.89$) and slope (0.14, $t = 2.75$) variances were significant. A moderate negative relationship (−0.25, $t = −3.10$) between the slope and intercept suggested that individuals with higher PsyCap levels at T1 showed less change in PsyCap than individuals with low scores on PsyCap at T1.

For work engagement, this model fit the data very well, $\chi^2(7) = 9.92$, $p = 19$. CFI = 0.995, RMSEA = 0.031 (0.00, 0.072). The mean coefficients for the intercept (6.49; $t = 169.92$) and slope (0.091, $t = 2.01$) were significant. Likewise, the intercept (0.37, $t = 5.031$) and slope (0.22, $t = 4.87$) variances were significant. A strong and negative relationship (−0.50, $t = −6.08$) between the slope and intercept suggested that individuals with higher work engagement levels at T1 showed less change in work engagement than individuals with low scores on work engagement at T1.

For job performance, this model fit the data very well, $\chi^2(35) = 102.89$, $p < 0.01$, CFI = 0.979, TLI = 0.973, RMSEA = 0.045 (CI95% = 0.035 0.055). The mean coefficients for intercept (7.79; $t = 172.64$) and slope (0.081, $t = 1.971$) were significant. Likewise, the intercept (1.45, $t = 14.15$) and slope (1.39, $t = 9.17$) variances were significant. A strong and negative relationship (−0.63, $t = −19.5$) between slope and intercept suggested that those with higher job performance levels at T1 showed less change in job performance than individuals with low scores on job performance at T1.

Multivariate LC model
The multivariate mediational LC model (Figure 1) yielded a good fit $\chi^2(12) = 556.88$, $p < 0.01$, CFI = 0.966, RMSEA = 0.054 (0.035, 0.073). As predicted, the intercepts of PsyCap, work
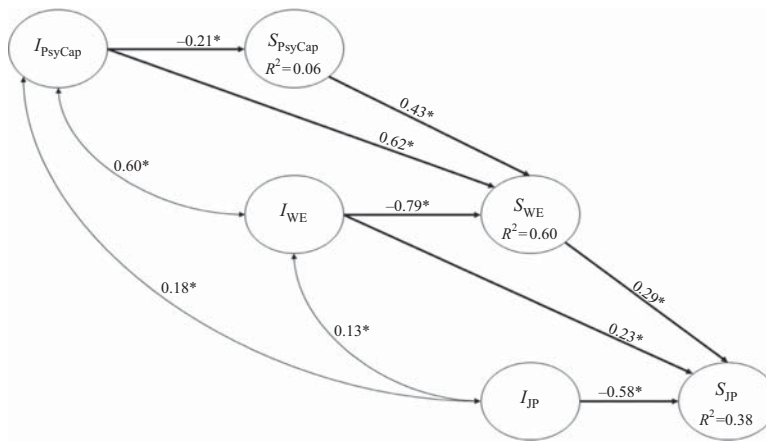
Notes: *I*, intercept; *S*, Slope; PsyCap, psychological capital; WE, work engagement;
JP, job performance. *$p < 0.05$

Figure 1.
Latent change
mediation model with
standardized
estimates

engagement and job performance (representing their absolute level) were significantly
associated (confirming *H2a* and *H3a*). The PsyCap intercept and slope significantly predicted
the work engagement slope (confirming *H2b* and *H2c*). In turn, the work engagement intercept
and slope significantly predicted the job performance slope (confirming *H3b* and *H3c*). All
slopes were significantly and negatively predicted by the respective intercept.

Overall, this model suggests that a change in work engagement plays a key role in fully
mediating the relations of PsyCap level and change with change in job performance. Indeed, the
indirect effect of the PsyCap intercept (24; CI95% = 0.16, 0.33), and slope (0.26; CI95% = 0.17,
0.36) on change in job performance through work engagement were statistically significant
(confirming *H4a* and *H4b*). Accordingly, as the intercept or the slope factor of PsyCap
increases, the slope factor of work engagement increases, as well as the slope factor of job
performance. Thus, the test of mediation indicates that PsyCap shifted the growth trajectory of
the job performance upward by changing the growth trajectory of work engagement.

We also tested for partial mediation, by allowing direct paths from PsyCap intercept
and slope to job performance slope. Including these paths in the model did not result
in a significant improvement of the model ($\Delta\chi^2(2) = 2.98$, $p = 0.23$).

Discussion

During the past decade new emphasis has been placed on investigating, clarifying, and
ultimately, understanding the relationship between employee positive states (such as
PsyCap and work engagement), and job performance (Luthans, 2002; Newman *et al.*, 2014).
This study contributes to this better understanding by investigating the dynamic nature of
such states along with job performance, and the mechanisms through which the positive
psychological resources of PsyCap may lead to higher work engagement and in turn
improved employee performance. In general, our results supported that the effect of PsyCap
on performance may be indirect and channeled through work engagement.

Stability and change of PsyCap, work engagement and job performance over time
Across a one-year span, individuals showed a significant, although small change (increase)
in PsyCap. In line with COR theory (Hobfoll, 1989), we can speculate that individuals tend to
accumulate and build up their PsyCap over time. A similar pattern of change was observed
in work engagement and job performance. Also this result is consistent with the idea of

agentic individuals able to promote their development (Bandura, 2008). However, we cannot exclude that these changes could be influenced by situational (e.g. support, feedback), or by individual (i.e. personality, motivational states) variables. Moreover, we believe that it is likely that these results could be highly dependent upon the timeframe used in the previous study. Accordingly, we do not exclude that one-year interval could be a very long interval for a variable theoretically expected to act "like a state."

Interestingly, previous levels of PsyCap, work engagement, and job performance, were strongly and negatively associated with their degree of change from Wave 1 to Wave 2. Accordingly, individuals with higher absolute scores at Wave 1 seem to develop less, maybe because they have less "room for improvement" or have a "ceiling effect" as compared to individuals with lower mean scores. This result suggests that individuals lower on PsyCap may benefit relatively more from targeted development interventions.

Initial support for a dynamic model

Another important implication of our results is the effect of PsyCap on work engagement over time can be disentangled into: an effect due to the absolute level of the construct, as observed at the preceding Wave; and an effect due to the observed change in PsyCap. Accordingly, absolute levels of PsyCap are not only associated with contemporaneous levels of work engagement and job performance, but individuals with high scores on PsyCap are expected to increase their engagement and performance over time.

Still another important finding is the significant (and positive) association between increases in PsyCap and increases in work engagement. This result supports the thesis that the development of work engagement is, at least to a certain extent, dependent on the development of PsyCap over time. In turn, it could also be said that the improvement in job performance may be dependent to a certain extent on the development of work engagement, and through this work engagement, on the absolute levels and on the development of PsyCap.

We recognize reciprocal relations among these constructs are possible, but they are difficult to investigate with two waves of data. Indeed, it is likely that the study participants' sense of fulfillment and positive affect resulting from positive evaluations of their work may, in the long run, contribute to the sustainability of their engagement and PsyCap. In the same vein, it is likely that more engaged workers prove more proactive in shaping their work environment, maximizing their job fit and thus showing higher PsyCap over time. Future studies, using more than two waves of assessment could enrich our results and help test these alternative models.

Theoretical and practical implications

There is much to gain in conceptualizing the relations among PsyCap, work engagement and job performance as dynamic, rather than static. Our results support the COR theory, in which employees are motivated to acquire, protect and foster their valued (psychological) resources to attain successful performance outcomes, in order to create a gain cycle of resources (Salanova *et al.*, 2010). Moreover, it provide further empirical validation for the idea that processes, like work engagement, are sustained by personal resources, and that these latter exerts mostly an indirect effect on organizational behavior outcomes (Xanthopoulou *et al.*, 2009b).

These results are important from a practical point of view, because they point to the importance of training interventions aimed at developing and sustaining PsyCap as an important determinant of workers' motivation and behavior within the organization. Considerable literature offers practical insights and guidelines for developing PsyCap (Luthans *et al.*, 2006, 2015; Luthans and Youssef-Morgan, 2017).

Limitations, future research and conclusions

The methodological strengths of this study include its two-wave data collection, the assessment of performance, and the temporal separation between predictors and job

performance. However, more time points would have allowed stronger longitudinal analysis and resulting examination of the causal (and reciprocal) relations among PsyCap, work engagement, and job performance over time. Indeed, while longitudinal data may be helpful in suggesting a putative temporal ordering in the relationships among constructs, they are still unable to definitively prove any causal relationship. Future studies should also test the validity of our model on samples of workers from other types of organizations, occupations and cultures. Another limitation is that the study used only one method to assess job performance (namely: supervisor ratings as input into the formal performance appraisal). A final limitation to note is that observed mean level changes may be affected by organizational and situational changes. In this case, the organizational context is relatively stable with prescribed roles and well-defined procedures. Employees are hired with permanent contracts and typically work in stable workgroups. However, future research should attempt to control for this external influence by explicitly measuring the perceived organizational and job changes. Despite the above limitations, our results provide evidence of the fact that when PsyCap increases, work engagement also increases and, in turn, performance.

Note

1. Note that the original scale is composed of three items. However, an issue during the first assessment phase determined the availability of only two of the three items in the present study.

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