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# Psychological Capital and Employee Performance: A Latent Growth Modeling Approach

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## Abstract

The positive core construct of psychological capital (consisting of efficacy, hope, optimism, and resilience) has been conceptually and empirically demonstrated to be related to employee performance. However, much of this work has relied on cross-sectional designs to examine these relationships. This study utilizes longitudinal data from a large financial service organization ( $N = 179$  financial advisory-type employees) to examine within-individual change in psychological capital over time and if this change relates to their change in performance. Latent growth modeling analyses revealed statistically significant within-individual change in psychological capital over time, and that this change in psychological capital was related to change in 2 types of performance outcomes (supervisor-rated performance and financial performance, i.e., individual sales revenue). Moreover, results of an exploratory cross-lagged panel analysis suggested a causal relationship such that prior psychological capital leads to subsequent performance rather than vice versa. Taken together, these results highlight the impact employees' psychological capital may have on their subjectively and objectively measured performance over time and offer evidence-based practical guidelines for human resource selection, development, and performance management.

Psychological capital has been demonstrated to be important for performance at both individual and group levels of analyses (e.g., see Gooty, Gavin, Johnson, Frazier, & Snow, 2009; Luthans, Avolio, Avey, & Norman, 2007; Walumbwa, Luthans, Avey, & Oke, 2011; Walumbwa, Peterson, Avolio, & Hartnell, 2010). In addition, psychological capital has been shown to provide additive value to more established measures of employees' positive behaviors, such as organizational citizenship (Walumbwa et al., 2011), as well as demographic and more traditional individual difference constructs such as core self-evaluations, personality traits, and person-organization and person-job fit (Avey, Luthans, & Youssef, 2010). Psychological capital has been defined as "an individual's positive psychological state of development that is characterized by (a) having confidence (efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (b) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; (c) making a positive attribution (optimism) about succeeding now and in the future; and (d) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success" (Luthans, Youssef, & Avolio, 2007, p. 3).

Despite the growing body of literature focusing on the relationship between psychological capital and job performance, this work has been limited to cross-sectional, correlation studies and has almost solely relied on supervisor ratings of employee performance. Although these studies have been valuable in helping to establish an initial relationship between employees' level of psychological capital and their performance, they are limited in two important ways. First, previous data are limited concerning the dynamic nature of the psychological capital construct (e.g., within-person change across time, or a growth trajectory is missing). Second, previous data are also limited regarding between-person differences in the change in psychological capital that can be used to predict performance. For example, according to a number of researchers (e.g., Bollen & Curren, 2006; Chan, 1998; Hackman, 2009; Ployhart & Vandenberg, 2010; Singer & Willett, 2003), an overreliance on simple cross-sectional methods with data collected at one point in time hinders the ability of researchers to capture within- and between-individual change. In order to more accurately test various theoretical mechanisms and assumptions regarding change, it is critical that we examine actual change in variables of interest using longitudinal research designs (Bollen & Curren, 2006; Singer & Willett, 2003).

Accordingly, the purpose of this study is to examine the relationship between employees' psychological capital and their job performance using a design and analytic approach that attempts to overcome some of the limitations of previous research. This study builds from earlier research by setting out to investigate the variability of psychological capital over time within individual employees to determine if psychological capital remained relatively static or whether it significantly changed over time. Furthermore, we examine the impact of the change in study participants' psychological capital on the change in their performance. Specifically, this study is designed to determine if a within-person increase (decrease) in psychological capital results in an increase (decrease) in an individual's performance. Repeated measures of employees' psychological capital and two measures of their performance (supervisor ratings and objective sales performance) are utilized to determine the nature and form of the proposed changes over time.

This study uniquely contributes to the positive organizational behavior literature in three important ways. First, we determine whether the positive relationship that has been found in previous research between self-reported psychological capital and subjective ratings of performance generalizes to objective measures of performance. Second, although the relationship between psychological capital and performance has been conceptualized (e.g., Luthans, Youssef et al., 2007; Youssef & Luthans, in press) and empirically tested in cross-sectional research and short run studies with minimal intervals between the collection of data (Luthans, Avolio et al., 2007; Walumbwa et al., 2010), to date no research has directly tested the stability or variability of one's psychological capital over time. A specific longitudinal test of the within-person variability of psychological capital is needed in order to draw more valid conclusions and practical implications pertaining to such change (Ployhart & Vandenberg, 2010). Finally, psychological capital has been clearly shown to be related to differences between individuals in their performance at a single point in time. A critical, yet unanswered, question is whether a within-person change in psychological capital predicts a change in that person's performance.

## **Theoretical Foundation and Hypotheses**

### *Conceptual Foundation for Psychological Capital Components*

Psychological capital is proposed as a common underlying capacity considered critical to human motivation, cognitive processing, striving for success, and resulting performance in the workplace. Consistent with the guidelines

for “theory borrowing” suggested by Whetten, Felin, and King (2009), psychological capital draws its foundation and explanatory mechanisms from theory building in work motivation (Stajkovic, 2006), positive psychology (Lopez & Snyder, 2009), and Bandura’s social cognition (1986, 1997) and agentic (2008) theories. For example, employees’ agency, exhibited through their intentions to deliberately determine the nature and magnitude of their psychological resource investment to attain work goals, can serve as an underlying mechanism for understanding the impact of psychological capital on performance outcomes (Bandura, 2008; Hannah & Luthans, 2008). It follows that psychological resource theories such as conservation of resources (COR) theory (Hobfoll, 2002; Wright & Hobfoll, 2004) can also be used to explain how employees are motivated to acquire, maintain, and foster the necessary resources as found in psychological capital to attain successful performance outcomes. Specifically, an individual’s motivational striving and choices can be explained by psychological resources such as efficacy, hope, optimism, and resilience that create higher-order “resource caravans” (or in this case, the core construct of psychological capital), which in turn impact motivation and performance (Hobfoll, 2002).

Drawing from these theories, psychological capital has been defined as a higher-order core construct consisting of four positive psychological resources (Luthans, Avolio et al., 2007; Luthans, Youssef et al., 2007). First, is efficacy—“one’s conviction (or confidence) about his or her abilities to mobilize the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context” (Stajkovic & Luthans, 1998, p. 66). Second, is hope—“a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy) and (b) pathways (planning to meet goals)” (Snyder, Irving, & Anderson, 1991, p. 287). Third, is optimism—both a positivity-oriented future expectation that can be developed (Carver & Scheier, 2002) and an attribution style that interprets positive events through personal, permanent, and pervasive causes and negative events through external, temporary and situation-specific ones (Seligman, 1998). Fourth and finally, is resilience—“the capacity to rebound or bounce back from adversity, conflict, failure, or even positive events, progress, and increased responsibility” (Luthans, 2002, p. 702).

When these four positive resources are combined, the result has been conceptually (Luthans, Youssef et al., 2007; Stajkovic, 2006) and empirically (Luthans, Avolio et al., 2007) demonstrated to be a higher-order, multidimensional construct labeled psychological capital. Specifically, psychological capital is the underlying core construct shared among its four component resources that is “one’s positive appraisal of circumstances and probability for

success based on motivated effort and perseverance” that can predict goal attainment and performance (Luthans, Avolio et al., 2007, p. 550).

### *The Malleability of Psychological Capital*

Perhaps the key distinguishing feature of one’s psychological capital and potentially important contribution to practice is its openness to change and development. Although not denying that the four individual components of psychological capital may seem to possess some level of stable qualities and have been represented in some of the earlier psychological literature as such, recent research shows that these components can be developed. For example, Bandura (1997, 2000) has demonstrated effective strategies to increase self-efficacy. Snyder (2000) also provided evidence that hope was developable and published a measure called the “state-hope scale” (Snyder et al., 1996). Furthermore, Carver and Scheier (2002) have recently discussed strategies to develop optimism, and Shifren and Hooker (1995) have demonstrated its situational measurement. Seligman’s (1998) widely recognized work has emphasized “learned optimism.” As to resilience, Masten and Reed (2002) have provided successful strategies for developmental interventions, and Wagnild and Young (1993) have developed a state-like measure of resilience.

Previous research has also shown that psychological capital as a whole has more measurement stability than emotional states but is not as stable as personality or self-evaluation traits (Luthans, Avolio et al., 2007) and has been shown to develop through targeted interventions (Luthans, Avey, Avolio, & Peterson, 2010; Luthans, Avey, & Patera, 2008). We therefore expect and set out to examine here whether measures of psychological capital show signs of variability within individuals over time and how those changes predict performance. Bandura’s (1986, 1997) social cognition and efficacy theory in general and his more recent emphasis on human agency (Bandura, 2008) in particular provides further explanation for the malleability of psychological capital through, for example, changes in efficacy due to mastery experiences, modeling, and feedback. Specifically, social cognitive theory identifies important components of agentic processing such as symbolizing, forethought, observation, self-regulation, and self-reflection, which can impact one’s level of agency to persevere toward success.

Besides these theoretical explanations for the malleability of psychological capital, there is recent empirical evidence that psychological capital may change based upon persistent, consistent information received from one’s leader (see Norman, Avolio, & Luthans, 2010). For example, psychological capital may be enhanced or decreased based upon repeated feedback from leaders, peers, or even the job itself. Imagine sales associates with a relatively low level of psychological capital who have not performed up to

expectations. If their leader were to repeatedly deliver reassuring, encouraging feedback versus constant criticism, they might begin to feel more optimistic or confident in increasing future levels of performance. It is important to note that because the individual's components of psychological capital work together synergistically, if one component is affected (e.g., optimism), it is likely the others (e.g., hope, efficacy, and/or resilience) will also be affected over time. Thus, employees' level of psychological capital may rise or fall over time, leading to the first hypothesis for this study as follows:

*Hypothesis 1:* There will be a change in participants' psychological capital over time; that is, there will be within-person variability in a participant's level of psychological capital.

### *Change in Psychological Capital and Employee Performance Over Time*

As indicated, previous research has demonstrated that employees' psychological capital is positively related to their performance (see Luthans, Avolio et al., 2007; Walumbwa et al., 2010), with most of this research using supervisor ratings rather than objective measures. Moreover, even though the basic premise of psychological capital is its "state-like" malleability, prior studies have used static measures of psychological capital (at one point in time) to predict performance at one later point in time. No prior research has examined the dynamic relationship between psychological capital and performance, that is, whether a within-person change in employees' level of psychological capital is related to a within-person change in their performance over time. Both objective performance (i.e., individual sales data) and the within-person variability of psychological capital in relationship to performance change over time are the foci of this study.

The state-like, dynamic nature of psychological capital was given attention in the above theoretical discussion in terms of agentic mechanisms (see Bandura, 2008) and resource theories such as COR (Wright & Hobfoll, 2004). These theories provide support to the idea that employees proactively build up their psychological capital resources over time to improve their future performance. In addition to the person's influence, employees' level of psychological capital is also subject to change (increase or decrease) depending on the work context such as the amount of social support they receive, leadership, and/or organizational climate. Moreover, macrolevel factors such as the state of the economy or dramatic personal events can also affect the level of psychological capital of employees.

The theoretical prediction would be a within-person increase or decrease in psychological capital will result in an increase or decrease in subsequent performance. For example, an employee who has just joined a work team or



has encountered a temporary setback to goal accomplishment may have a relatively lower level of psychological capital. However, this individual can intentionally and proactively (i.e., agentially) build up his/her psychological capital (i.e., higher levels of optimism, efficacy, hope, and resilience) in order to improve performance relatively quickly or, in the case of encountering a problem or obstacle, to pursue an alternative pathway for goal attainment and ultimate success. Thus, an increase in employees' psychological capital provides more resources and a stronger foundation for them to draw from and achieve an increase in subsequent performance. Similarly, a decrease in psychological capital may deprive individuals and take away from such a reservoir of resources, resulting in the employee having lower subsequent performance. For example, this reservoir of psychological capital that employees have can be metaphorically depicted as a bank account (Avolio & Luthans, 2006). As discussed above, the malleability of psychological capital suggests that employees are continuously depositing to or withdrawing from their psychological capital bank account that is expended on striving for or attaining (or detracting from when the account balance goes down) goals and resulting performance outcomes.

Based on the malleability of psychological capital induced by the context and/or the individual and the notion that psychological capital represents a reservoir or bank account of resources a person can draw from for goal attainment, we expect that an employee's increase (decrease) in psychological capital will be related to an increase (decrease) in supervisor-rated performance and in objective performance (i.e., sales revenue). Thus, we hypothesize the following:

*Hypothesis 2a:* Change in employee's level of psychological capital (represented by the slope of psychological capital) is positively related to change in supervisor-rated performance.

*Hypothesis 2b:* Change in employee's level of psychological capital (represented by the slope of psychological capital) is positively related to change in sales revenue.

## Method

### *Sample and Procedure*

The sample for this study is composed of 179 employees from the retail advisory department of a large financial service organization based in the northeastern United States. Employees were primarily male (84%), middle-aged ( $M = 46.7$  years), and had been with the firm for an average of 3 years. Our focus on advisory employees is important because objective performance



of these employees can change rather quickly. Financial advisors are evaluated primarily based on revenue they bring for the firm. Industry reports have suggested that the success of financial advisors most often depends on the advisors' personal credibility, demeanor, and motivation (Brown, 2010). Similarly, subjective evaluations are based on meeting role expectations and tend to emphasize the number of meetings scheduled with clients or potential clients, sponsoring events to "woo" clients, and overall positive interactions with clients.

The financial advisors were informed that the general purpose of the study was to examine how they felt about their current job role. It was emphasized that participation in filling out a series of short electronically administered surveys was voluntary, confidential, and noncompensated and that their responses were confidential and would only be reported in the aggregate to the company. A memo along with the survey link was sent from the president to encourage participation. After list-wise deletion of cases with substantial missing information, the sample yielded an overall response rate of 82% across the three waves of data collection.

Repeated measures data at the individual-level were collected at three time periods, an acceptable number for longitudinal designs (Chan, 1998). Specifically, in line with our latent growth modeling approach to analyzing the data (see Van Iddekinge et al., 2009), we collected repeated measures pertaining to both psychological capital and two separate measures of the financial advisors' performance every 3 months, resulting in an approximate 7-month data collection process.

The first survey was sent to financial advisors during the first week of Month 1 (i.e., Time 1). At this initial time period, the survey included the study description, consent agreement to participate, and request for demographic information, as well as the baseline measure of psychological capital. Participants then completed the second wave of the survey almost exactly 3 months later (i.e., Time 2), consisting of only the psychological capital measure. Finally, they completed a third and final psychological capital survey 3 months after Time 2 (i.e., Time 3), with all time periods separated by 3 months (Month 1, Month 4, and Month 7).

Repeated measures of performance were also collected. Objective measures of the employees' sales performance were provided by the organization at the end of each month following psychological capital data collection. Subjective measures of employees' performance were provided by the advisors' direct supervisor. The supervisors were sent a Web-survey asking them to complete a short performance evaluation of each advisor they supervised. These performance data were also collected at the end of the month following psychological capital data collection and followed the established performance cycle in the host organization.

## *Measures*

**Psychological capital.** Psychological capital was measured using the 24-item Psychological Capital Questionnaire (PCQ) empirically validated by Luthans, Avolio et al. (2007).<sup>1</sup> This PCQ adapts six items each from published measures on efficacy (Parker, 1998), hope (Snyder et al., 1996), optimism (Scheier & Carver, 1985), and resilience (Wagnild & Young, 1993). Sample items include the following: (a) Efficacy: “I feel confident in representing my work area in meetings with management” and “I feel confident helping to set targets/goals in my work area”; (b) Hope: “Right now I see myself as being pretty successful at work” and “If I should find myself in a jam at work, I could think of many ways to get out of it”; (c) Resilience: “When I have a setback at work, I have trouble recovering from it, moving on (R)” and “I usually take stressful things at work in stride”; and (d) Optimism: “I always look on the bright side of things regarding my job” and “If something can go wrong for me work-wise, it will (R).” Items were assessed using a 6-point Likert-type scale ranging from 1 = strongly disagree to 6 = strongly agree and framed by the statement to “describe how you may think about yourself right now.” In this study, the average coefficient alpha was 0.98.

We conducted three separate confirmatory factor analyses (CFAs) on the psychological capital measure at each time point to assess its validity. The model fit results supported the validity of the four-dimension structure of psychological capital (average CFI = 1.00, average TLI = 1.00, RMSEA ranged from 0.05 to 0.07, and average SRMR = 0.00).

**Objective performance.** The organization provided objective performance data as sales revenue under management of the financial advisor for the month immediately following the collection of psychological capital data. This raw sales revenue measure had a mean of 1.01 million dollars per advisor ranging from 0 to \$7.05 million across three occasions. We used the natural-log transformed measures in our analysis.

**Supervisor ratings of performance.** At the end of the month following the collection of psychological capital, employees’ supervisors completed a short three-item survey regarding their evaluation of their employees’ performance. Supervisors were asked to rate their employees on a scale ranging from 1 = strongly disagree to 5 = strongly agree on the following items: This employee “meets his or her performance expectations,” “performs the tasks asked of him or her,” and “fulfills the responsibilities stipulated by management.” Means and alphas ranged from 3.33 to 3.49 and from 0.86 to 0.92, respectively, for the three time points.

1. The Psychological Capital Questionnaire (PCQ) is available for research purposes at <http://www.mindgarden.com/products/pcq.htm>

**Control variables.** Because previous research (e.g., Schaubroeck, Lam, & Cha, 2007) suggests that employees' age and sex may influence their performance, we included these demographic variables in our analyses. In addition, we controlled for employees' trait-like individual differences using the core self-evaluation construct, measured at Time 1 (e.g., Judge, Erez, Bono, & Thoresen, 2003). This construct was chosen because it has been positively linked to job performance, self-determination, and work success (e.g., Grant & Wrzesniewski, 2010; Judge & Bono, 2001; Judge & Hurst, 2008). We used the 12-item Core Self-Evaluations Scale (CSES; Judge et al., 2003) anchored on a 5-point scale (1 = strongly disagree to 5 = strongly agree). Sample items included: "I am confident I get the success I deserve in life" and "I am capable of coping with most of my problems." The coefficient alpha was 0.94.

## Analysis and Results

### *Descriptive Statistics and Analytic Strategy*

Descriptive statistics are provided in Table 1. Measurement-scale reliabilities for psychological capital were estimated for each measurement occasion using coefficient alpha and showed high consistency across time.

We used multiple-indicator latent growth modeling (MLGM) using the statistical software Mplus (Muthén & Muthén, 1998–2010) to test our Hypotheses 1–2b. Extending the conventional latent growth models that use manifest variables for each time point, multiple-indicator latent growth models use multiple items to represent a latent variable for every time point (Chin, 1998). Thus, measurement errors and unreliability are more accurately modeled using this approach (McArdle & Epstein, 1987).

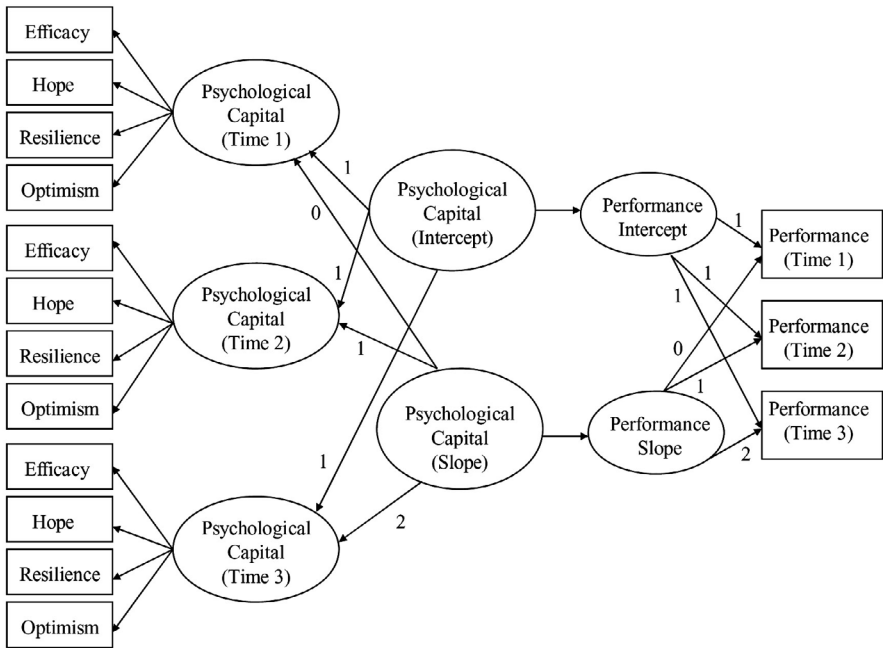
In order to achieve an optimal ratio of sample size to the number of estimated parameters in the model (Cattell & Burdsal, 1975; Chin, 1998), we calculated the four subdimensions of psychological capital and then used these subscales as indicators of the latent psychological capital variable for a given time point (see Fig. 1). In addition, because psychological capital was measured at three time points, it was necessary to test for measurement invariance of the three latent psychological capital variables. To do this, we specified the intercepts and factor loadings of the corresponding indicators to be equal over time (see Muthén & Muthén, 1998–2010). The measurement invariance model for psychological capital showed satisfactory fit ( $\chi^2[69, n = 179] = 126.07$ , CFI = 0.98, TLI = 0.99, RMSEA = 0.06, SRMR = 0.03).

Next, we fitted a separate univariate latent growth model of the psychological capital, supervisory-rated performance, and sales revenue in order to determine the functional form of the growth curve. For all three variables, a linear growth model provided good fit. Because of the relatively

Table 1. Descriptive Statistics and Correlations for Observed Variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Sex (F= 0, M= 1)	0.84	0.37	–										
2. Age	46.67	6.44	.00	–									
3. Core self-evaluation	3.64	0.74	–0.05	–0.08	(0.94)								
4. Psychological capital (T1)	3.65	0.75	0.00	0.08	0.49	(0.98)							
5. Psychological capital (T2)	3.52	0.91	–0.13	–0.04	0.25	0.50	(0.98)						
6. Psychological capital (T3)	3.51	0.92	0.05	0.15	0.16	0.41	0.24	(0.97)					
7. Rated performance (T1)	3.49	0.92	0.15	0.07	0.23	0.68	0.33	0.26	(0.89)				
8. Rated performance (T2)	3.33	0.82	–0.02	0.03	0.18	0.55	0.69	0.38	0.51	(0.92)			
9. Rated performance (T3)	3.44	0.83	0.07	0.14	0.23	0.54	0.39	0.65	0.51	0.60	(0.86)		
10. Log sales revenue (T1)	11.49	4.10	–0.03	0.10	0.10	0.32	0.32	0.53	0.17	0.30	0.39	–	
11. Log sales revenue (T2)	11.20	4.04	0.04	0.05	0.23	0.35	0.38	0.15	0.33	0.37	0.28	0.23	–
12. Log sales revenue (T3)	11.25	3.79	–0.05	0.11	0.09	0.31	0.14	0.07	0.25	0.11	0.13	0.08	0.12

N = 179. Correlations greater than 0.15 are significant at  $p < 0.05$ ; those greater than 0.19 are significant at  $p < 0.01$ ; those greater than 0.25 are significant at  $p < 0.001$ . Reliability coefficients are reported along the diagonal in parentheses.



**Figure 1.** Multiple-Indicator Latent Growth Model.

small sample size, we tested two separate bivariate latent growth models for each outcome measure (i.e., Model 1: controls, psychological capital, and supervisory-rated performances; Model 2: controls, psychological capital, and sales revenues). To reduce model complexity and to increase statistical power, the three items for the supervisor performance rating at single time points were averaged to create an indicator of supervisory-rated performance. Finally, consistent with prior research suggesting a need to accommodate autocorrelation among longitudinal data (e.g., Bentein, Vandenberg, Vandenberghe, & Stinglhamber, 2005; Van Iddekinge et al., 2009), we included the residual covariance between consecutive indicators of the same variable (e.g., supervisor performance ratings at Time 1 and Time 2, sales revenues at Time 2 and Time 3, etc.).

We used latent intercept and slope factors for psychological capital to predict the latent intercept and slope for each performance variable. A significant path between the slope factor for psychological capital and for performance would indicate change in the former variable is related to change in performance. In addition, to ensure that we obtained unbiased inferences on parameters, we used 1,000-replication bootstrapping to obtain the confidence intervals of the path coefficients. In all the analyses, we controlled for age, gender, and core self-evaluation. Finally, to control for the effect of the economic ups and downs, we adjusted the sales revenue by the consumer confidence index for the month when sales revenue was collected.

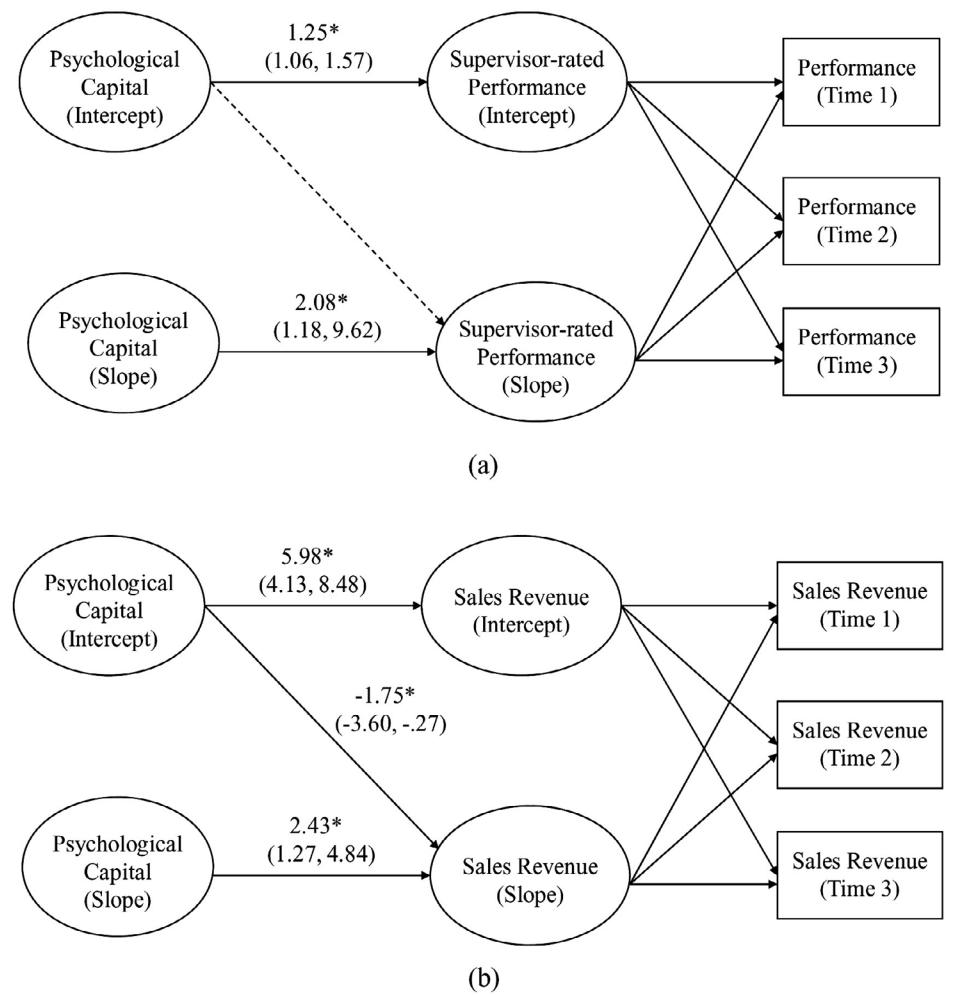
### *Hypotheses Tests*

Hypothesis 1 stated that there would be a change in participants' psychological capital over time. This hypothesis was supported by the significant mean of the latent slope factor for psychological capital. In the univariate latent growth model for psychological capital, the latent slope has a mean of  $-.07$  (s.e. =  $0.03$ ,  $p < 0.05$ , bootstrapped 95% confidence intervals  $-0.15$  to  $-0.02$ ), showing that individuals' psychological capital was declining over time. Thus, Hypothesis 1 received support.

Hypotheses 2a and 2b posited that change in the employee's level of psychological capital (represented by the latent slope factor of psychological capital) would affect changes in supervisor-rated performance and sales revenue, respectively. Results testing these hypotheses are shown in Figures 2(a) and 2(b). Specifically, as Figure 2(a) shows, the latent slope of psychological capital is significantly related to the latent slope of supervisor-rated performance ( $B = 2.08$ ,  $p < 0.01$ , bootstrapped 95% confidence interval  $1.18$  to  $9.62$ ). This bivariate latent growth model shows overall good fit ( $\chi^2[138, n = 179] = 282.92$ , CFI =  $0.96$ , TLI =  $0.96$ , RMSEA =  $0.07$ , SRMR =  $0.07$ ). Moreover, Figure 2(b) shows the latent slope for psychological capital is significantly related to the latent slope for sales revenue ( $B = 2.43$ ,  $p < 0.01$ , bootstrapped 95% confidence interval  $1.27$  to  $4.84$ ). This bivariate latent growth model also demonstrates good fit ( $\chi^2[137, n = 179] = 230.71$ , CFI =  $0.98$ , TLI =  $0.97$ , RMSEA =  $0.06$ , SRMR =  $0.05$ ). Therefore, Hypotheses 2a and 2b also received support.

### *Supplementary Analyses*

Based on our results from Hypotheses 2a and 2b, we explored the causal direction between psychological capital and employee performance. Does a change in psychological capital predict a change in employee performance, vice versa, or is the relationship reciprocal? As discussed above, there is reason to believe that a change in the combined agentic capacity of psychological resources of efficacy, hope, optimism, and resilience representing psychological capital will lead to better (or if declining, worse) employee performance. However, there may also be reasons why the causal direction may be reversed. For example, an employee having a record high (low) performing month will undoubtedly feel a stronger (weaker) combined sense of efficaciousness, hopefulness, optimism, and resilience about the next month's performance. In addition, both causal directions could be valid, such that the relationship between psychological capital and performance may be one of reciprocal causation. For instance, employees who are higher (lower) in psychological capital may perform better (worse), and this higher (lower)



**Figure 2.** (a) Latent Growth for Psychological Capital and Supervisor-Rated Performance. (b) Latent Growth for Psychological Capital and Sales Revenue Performance. Bootstrapped 95% confidence interval is reported in parentheses. Controls are not shown for clarity. Dashed arrow was estimated at zero and thus was excluded in the final model. The paths are unstandardized coefficients. \* $p < 0.001$ .

performance may allow them to further develop a more (less) positive state of development.

In an exploratory analysis, we attempted to shed further light on these issues by conducting a cross-lagged panel analysis, which allowed us to test the relative fit of models that specify alternative causal directions between psychological capital and performance. Using Mplus, we fitted three structural models for each of the two performance measures. The first model is



**Table 2.** Fit Statistics for Models From the Cross-Lagged Panel Analyses

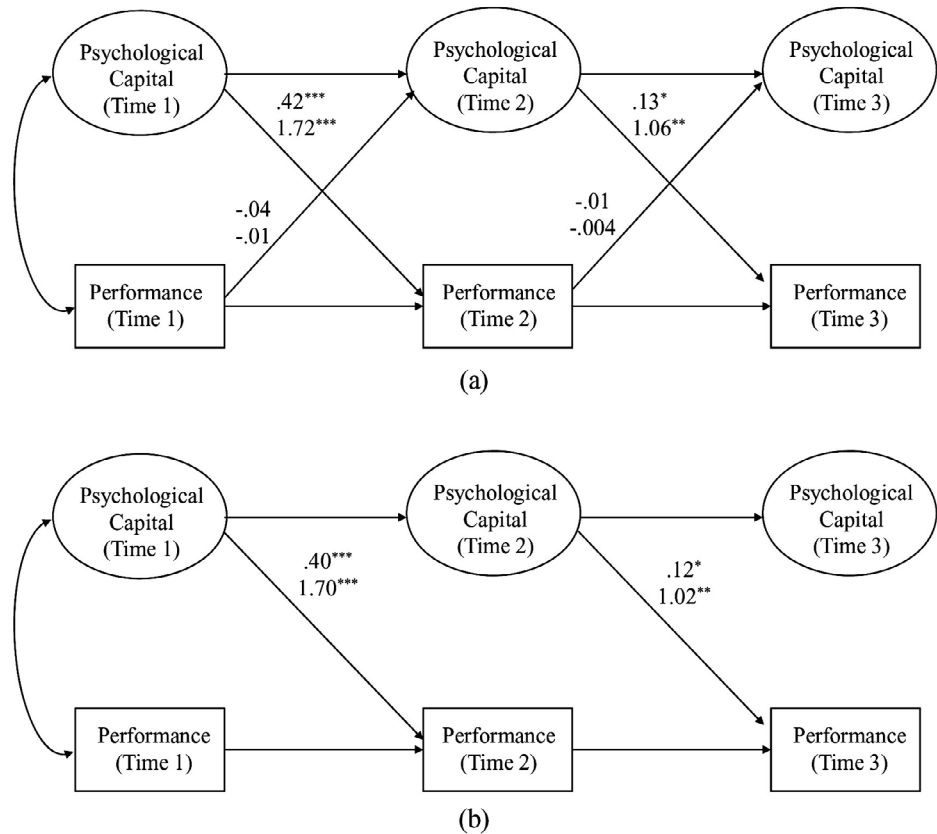
Variable and model	$\chi^2$	df	$\Delta\chi^2$	CFI	TLI	RMSEA	SRMR
PsyCap and rated performance							
1. PsyCap $\leftrightarrow$ performance	203.96	101		0.97	0.97	0.075	0.119
2. PsyCap $\rightarrow$ performance <sup>a</sup>	207.81	103	3.85	0.97	0.97	0.075	0.122
3. Performance $\rightarrow$ PsyCap	229.10	103	25.14*	0.97	0.97	0.083	0.167
PsyCap and sales revenue							
1. PsyCap $\leftrightarrow$ performance	255.93	101		0.96	0.96	0.093	0.138
2. PsyCap $\rightarrow$ performance <sup>a</sup>	257.19	103	1.26	0.96	0.96	0.091	0.138
3. Performance $\rightarrow$ PsyCap	275.78	103	19.85*	0.95	0.95	0.097	0.160

a. Model-fitted data significantly better than alternative models based on change in chi-square statistics. PsyCap = Psychological capital. \*  $p < 0.001$

a reciprocal causality model in which both paths from earlier measures of psychological capital to performance and those from earlier measures of performance to psychological capital are included. The second model is a proposed causality model in which only paths from earlier measures of psychological capital to performance were included. The third model is a reverse causality model in which only paths from earlier measures of performance to psychological capital were included. Figures 3(a) and 3(b) illustrate the first and second model. Because the second and third models are nested within the first model, we can compare their relative fit by testing the chi-square differences.

Following previous research using cross-lagged panel models (e.g., Finkel, 1995; Van Iddekinge et al., 2009), we included autoregressive paths between consecutive measures of psychological capital and consecutive measures of performance. In addition, the Time 1 measure of psychological capital was allowed to correlate with the Time 1 measure of performance, and residual covariances were allowed between same-period measures of psychological capital and performance. Table 2 shows the model fitting results among the alternative models for testing causal directions.

For both measures of performance, all the three models show acceptable fit and very small differences in the fit indexes across the models. However, based on chi-square difference tests, we found that the causal model (Model 2) fits the data better. For supervisor-rated performance, Model 2 shows a nonsignificant change in chi-square ( $\Delta\chi^2 = 3.85$ ,  $df = 2$ , ns) from the reciprocal causality model (Model 1, the full model). In contrast, the reverse causality model (Model 3) shows a significantly worse fit ( $\Delta\chi^2 = 25.14$ ,  $df = 2$ ,  $p < 0.001$ ) than Model 1. Thus, results of the exploratory analyses revealed that Model 2 provided the best fit to the data, offering preliminary



**Figure 3.** (a) Cross-Lagged Panel Model for Psychological Capital and Individual-Level Performance (Reciprocal Causality Model). (b) Cross-Lagged Panel Model for Psychological Capital and Individual-Level Performance (Proposed Causal Model). Coefficients for manager-rated performance and sales revenue are reported on first and second Line, respectively. Residual covariances between same-period measures of psychological capital and performance are not shown for clarity. The paths are unstandardized coefficients. \*  $p < 0.05$  ; \*\*\*  $p < 0.001$  ; \*\*  $p < 0.01$

evidence that the direction of influence is from psychological capital to subjectively rated employee performance (see Fig. 3a and 3b for path coefficients for Models 1 and 2).

Similar results were found for sales revenue. The causal model suggesting that psychological capital influences employee performance (Model 2) shows nonsignificant change in chi-square from the reciprocal causality model (Model 1), whereas the reverse causality model was significantly worse than Model 1 ( $\Delta\chi^2 = 19.85$ ,  $df = 2$ ,  $p < 0.001$ ). Thus, the data suggested that the causal direction was from psychological capital to employee sales revenue, rather than vice versa or reciprocal.

## Discussion

Our study results show that overall, employees' psychological capital change over time, but in the sample surveyed, we found a decreasing trajectory. We also found that a change in psychological capital (represented by the slope of psychological capital) affected a change in both supervisor-rated and objective (sales revenue) employee performance. For example, employees who demonstrated an increase (or decrease) in psychological capital also showed an increase (or decrease) in their performance. Finally, the direction of influence seems to go from psychological capital to performance, rather than vice versa or reciprocal in terms of causation.

### *Contributions to Theory Building*

We believe that our findings make several important theoretical contributions to the positive organizational behavior literature. According to Ployhart and Vandenberg (2010), developing a complete theory of change requires that researchers explain the form of change (e.g., linear, nonlinear), the predictors of change, the level of change (e.g., intra-unit, inter-unit), and why the change occurs. In this study, we were able to contribute to most of these goals. Regarding the form of change, our univariate and bivariate latent growth analyses indicated that a linear form of change trajectory fit our data well for both psychological capital and two common measures of employee performance. These results demonstrate that a within-person change in psychological capital is predicting the within-person change in performance in that order. These findings suggest that psychological capital may provide a psychological resource that employees can draw from in order to increase their performance.

An additional theoretical contribution of this study concerns the finding that psychological capital changed over the several months of this study. This finding offers additional support for the premise that psychological capital is malleable. Although prior research had indicated that psychological capital can be developed in short, focused training interventions (e.g., Luthans, Avey et al., 2010; Luthans, Avey et al., 2008), this is the first study to directly test the stability or within-person variability of psychological capital over time. In this study the within-person variability of participants' psychological capital exhibited a decreasing growth trajectory resulting in lower levels of psychological capital at Time 3.

Because there were no interventions employed to increase psychological capital, this negative trajectory is not at all counterintuitive. Using Ployhart and Vandenberg's (2010) criteria, our study can explain the form and level (i.e., within-person) of change but not why the change occurred—in this case a drop in psychological capital. We could speculate that the negative

change had to do with situational, contextual variables that might include level of social support, leadership/organizational climate, and/or the economy. However, this speculation will need to be verified in future longitudinal research on psychological capital.

Finally, in addition to contributing to a theory of psychological capital change, this longitudinal study represents the strongest support to date for the linkage between employees' psychological capital and performance. The results from this study suggest employees' psychological capital is positively related to multiple measures of performance including both supervisor-rated and objective sales performance.

### *Limitations and Future Research*

Although this study has a number of strengths, certain limitations must be noted. For example, despite a longitudinal design and an analytic approach that can support causal inferences, we cannot definitively conclude that psychological capital causes employee performance. Only a true experimental design can draw such conclusions. In addition, in this study, we did not test any hypotheses regarding causal direction. Future research should derive specific hypotheses a priori regarding causal direction and continue to explore temporal sequence using both longitudinal designs that cover longer time frames and experimental designs.

A second potential limitation is the generalizability to other samples, contexts, and performance measures. This sample was composed of financial advisors, who displayed a diminishing level of psychological capital in terms of their self-reported evaluations. Although statistically significant, these within-person changes in psychological capital are only moderate in magnitude. These changes could be due to uncertainties in the financial markets, less positive business cycles, and/or internal changes within the social, leadership, and organizational climate as well as a host of other factors that we were not able to account for in this study. Consequently, the results reported here may not generalize to other types of employees, levels of analysis, industries, job types, or organizational/national/international cultures. Simply put, we still cannot explain why psychological capital changes occurred within individuals or the conditions that drive the direction of that change. These unanswered questions provide fertile ground for future research.

Recent research has started down this path of analyzing the impact of individual differences. For example, Walumbwa et al. (2010) found that leaders are able to influence psychological capital in employees via their own psychological capital. They theorized that through the process of contagion or role modeling, leaders may drive psychological capital variability

in followers. In addition, according to a number of researchers (e.g., Conley, 1984; Cropanzano & Wright, 1999; Fleeson, 2001; Wright, 2007), defining a psychological construct as state-like is largely determined by the relative degree of stability or variability in measurement. Therefore, to better understand the reasons for the within-person variability in psychological capital, future research may need to test the relationship between the within-person variability of psychological capital and individual difference variables such as core self-evaluations, positive emotions, or the Big Five personality traits to determine if psychological capital changes more or less depending upon these individual difference factors. For example, high positive affectivity may buffer employees from psychological capital variability whereas low levels may make them more susceptible to change in psychological capital.

Another question for future research pertains to why psychological capital would “cause” employee performance to change at all. Future research may determine that higher psychological capital leads to setting higher goals or to specific actions that drive goal attainment. Or, maybe individuals higher in psychological capital report greater interpersonal resources and peer/group support that allow them to function more effectively with clients or customers over longer periods of time. It is also possible that psychological capital creates more frequent positive affective states that then lead to emotional contagion. In this case, this is the sales encounter, leading clients or customers to have a more positive mood, and therefore they are more likely to purchase and invest. Although this study did not directly test these possibilities, future research should explore these and other potential explanatory processes for the impact that psychological capital has on performance.

Finally, regarding the relationship between psychological capital and performance, future work needs to consider the boundary conditions for this relationship. In addition to previous work that has indicated that psychological capital is a mediator between supportive climate and performance (Luthans, Norman, Avolio, & Avey, 2008), recent research has explored the role of climate as a potential moderating variable. For example, in service-oriented organizations, Walumbwa et al. (2010) found that the relationship between psychological capital and performance was stronger when employees’ perceptions of service climate were high. Future research should continue to explore other potential mediating and moderating variables of the psychological capital–performance relationship.

### *Practical Implications and Conclusion*

Results of this study reveal several important practical implications for human resource management of today’s organizations. Overall, our findings

provide further evidence that psychological capital can be an important, largely overlooked resource to positively impact employee job performance. Specifically, psychological capital may prove useful to human resource developmental processes and performance management. Given the existence of a reliable and valid measure of psychological capital (i.e., the PCQ; Luthans, Avolio et al., 2007; Luthans, Youssef et al., 2007), organizations may choose to assess employees' psychological capital to determine which employees may thrive in certain situations or roles. In particular, the level of an employee's psychological capital may be an important resource for being considered for ambiguous, complex, challenging, or crisis-oriented assignments because psychological capital may buffer employees from the potential stress associated with such assignments (e.g., see Avey, Luthans, & Jensen, 2009).

Like any self-report measure with potential biases in terms of social desirability, the PCQ should be paired with other types of assessment to ensure organizations are getting a valid picture of employees' psychological capital. After all, it is hard to imagine an employee admitting that he or she lacks hope, is pessimistic, is not confident, and does not deal well with failure. Although positive psychologists note that such social desirability issues are "hardly a nuisance variable when one studies what is socially desirable" (Peterson & Seligman, 2003, p. 18), to overcome the tendency to "fake good," organizations could ask for peer or managerial ratings of psychological capital to check for convergence with the employees' self-rating. If this is not an option either because the employee is too new to the organization or it is cumbersome administratively, organizations could structure their performance reviews to include behavior associated with psychological capital. For example, questions pertaining to how well employees bounce back from adversity, find alternative solutions to problems, welcome challenging situations, or maintain a positive outlook despite setbacks could add valuable data to enhance confidence in determining employees' level of psychological capital.

Moreover, given our finding of within-person variance in employees' psychological capital, this study provides additional evidence that psychological capital is indeed open to development and should therefore be integrated into organizations' human resource development and performance management programs. Specifically, organizations should utilize developmental interventions aimed at increasing and sustaining overall psychological capital both in supervisors and their associates. For example, relatively short (1–3 hours) training interventions have been developed for overall psychological capital (e.g., see Luthans, Youssef et al., 2007, Chapter 8) and have been tested for both online delivery (Luthans, Avey et al., 2008) and in traditional face-to-face workshops (Luthans, Avey et al., 2010).



This psychological capital training includes exercises focused on helping participants to set realistic, relevant goals and verbalize and circumvent obstacles in order to increase hope (Snyder, 2000). The training also instructs participants how to reframe setbacks or establish contingency plans when problems or obstacles occur in order to enhance optimism (Carver & Scheier, 2002). Moreover, it draws from resilience training advocated by Masten and Reed (2002). They emphasize building one's assets (e.g., becoming more promotable) and proactively avoiding risky, potentially adverse events (e.g., failing to meet expectations such as a deadline). Finally, and perhaps most effectively, psychological capital training can utilize well-established approaches of how to increase efficacy through task mastery, modeling, vicarious learning, positive feedback, and arousal (Bandura, 1997).

Beyond training per se, Walumbwa et al. (2010) found that leaders who role model psychological capital are likely to have higher psychological capital in their followers. Besides simply modeling higher levels of psychological capital, leaders also have the power to remove blockages to goal attainment by enhancing role clarity, providing access to scarce resources, or empowering followers to make decisions. In addition, leaders can build confidence and resilience via feedback mechanisms. In short, leaders may be able to provide paths to goal attainment, thereby building employees' psychological capital.

In conclusion, this study's results provided the first longitudinal evidence to support the malleable nature of psychological capital and its relationship with employee performance. These findings provide evidence-based value for the recognition and investment in psychological capital for human resource development and performance management.

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