

Meta-Analysis of the Impact of Positive Psychological Capital on Employee Attitudes, Behaviors, and Performance

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The positive core construct of psychological capital (or simply PsyCap), consisting of the psychological resources of hope, efficacy, resilience, and optimism, has recently been demonstrated to be open to human resource development (HRD) and performance management. The research stream on PsyCap has now grown to the point that a quantitative summary analysis of its impact on employee attitudes, behaviors, and especially performance is needed. The present meta-analysis included 51 independent samples (representing a total of N = 12,567 employees) that met the inclusion criteria. The results indicated the expected significant positive relationships between PsyCap and desirable employee attitudes (job satisfaction, organizational commitment, psychological well-being), desirable employee behaviors (citizenship), and multiple measures of performance (self, supervisor evaluations, and objective). There was also a significant negative relationship between PsyCap and undesirable employee attitudes (cynicism, turnover intentions, job stress, and anxiety) and undesirable employee behaviors (deviance). A sub-analysis found no major differences between the types of performance measures used (i.e., between self, subjective, and objective). Finally, the analysis of moderators revealed the relationship between PsyCap and employee outcomes were strongest in studies conducted in the United States and in the service sector. These results provide a strong evidence-based recommendation for the use of PsyCap in HRD and performance programs. Theoretical contributions, future research directions, and practical guidelines for HRD conclude the article.

Gallup Polls in recent years suggest that Americans are pessimistic about incremental job growth and investors are not confident in the future of the economy.

President Obama was swept into office on his “audacity of hope” and remained confident and optimistic in his call for resilience in the face of very difficult economic, geopolitical, and social challenges. From the standpoint of organizations in such a turbulent environment, managers in general, and human resource managers in particular, have to ask: Do such positive beliefs really matter, or is this just hollow political rhetoric?

One critical position is that positivity is an illusion and can even be harmful. For example, Hedges (2009, p. 117) calls into question the validity of positive psychology by referring to the field as “quack science.” However, despite such critical observations, there is considerable growing scientific evidence of the value of a positive mind-set and positive beliefs in one’s relationships, well-being, and work (e.g., see the meta-analysis of Lyubomirsky, King, & Diener, 2005). The same has been true of the positive approach to the workplace in the form of what has been termed positive organizational behavior (POB) and positive organizational scholarship (POS). Critics such as Fineman (2006) have voiced concern that positive organizational behavior only considers a strength-based approach and potentially ignores the importance of a deficit-based approach. Moreover, Hackman (2009, p. 309) recently noted: “The passion and productivity that characterizes research on positive organizational behavior (POB) is impressive. Yet POB research is accumulating so rapidly that it may exceed what the field’s conceptual, methodological, and ideological foundation can bear.” However, similar to the meta-analyses on research being conducted in positive psychology, the time has come to empirically address some of Hackman’s concerns by conducting a meta-analysis on the research so far on a major positive construct in positive organizational behavior termed “psychological capital.”

Psychological capital, or simply PsyCap, has been conceptually identified by Luthans and colleagues (Luthans, 2002; Luthans & Youssef, 2004; Luthans, Youssef, & Avolio, 2007) as consisting of the four positive psychological resources of hope, optimism, efficacy, and resilience, which, when combined, have been empirically determined to be a second-order core construct (Luthans, Avolio, Avey, & Norman, 2007). A second-order construct is the shared variance between the four first-order constructs (hope, optimism, efficacy, and resilience). The comprehensive definition is that PsyCap is:

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

(Luthans, Youssef, & Avolio, 2007, p. 3)

Although research in PsyCap is still certainly emerging, we suggest it is more effective to conduct a review, refocus, and do a meta-analysis now, rather than wait for the potential disorder in theory building and measurement that concerned Hackman (2009), or what Glick and colleagues have called “disconsensus” (Glick, Miller, & Cardinal, 2007). Positive psychology has already published considerable research on each of the individual components of PsyCap (see Lopez & Snyder, 2009), including some meta-analyses (e.g., see the Stajkovic & Luthans, 1998a, meta-analysis on efficacy) that generally demonstrate each component is desirable in an organization specifically, and in life in general. However, we agree with Stajkovic (2006) that there can be unique, added value in meta-analytically examining the aggregate of the components as a core construct. Therefore, the purpose of this study is to provide a comprehensive, quantitative review of both published and unpublished research to date on the impact of PsyCap on various employee outcomes.

Consistent with the purpose of the study, not only does the meta-analysis provide a comprehensive quantitative review of existing research on PsyCap, but it also explores whether moderators can help explain the variability in the effect sizes reported in individual studies. Specifically, we test the following moderators: U.S.-based vs. non-U.S.-based samples, student vs. working adult samples, and manufacturing vs. service samples. Understanding the role of these potential moderators, as well as examining whether the type of performance measure affects the relationship with PsyCap, all have important implications for future research. Moreover, since recently PsyCap has been clearly demonstrated to be open to development (Luthans, Avey, Avolio, & Peterson, 2010; Luthans, Avey, & Patera, 2008), this meta-analysis and the moderators can provide specific, evidence-based value of PsyCap and practice guidelines for implementing positivity in the workplace in general and human resource development (HRD) and performance management in particular.

The Background and Foundation of Psychological Capital

Although the potential benefits from positivity in general have been formally recognized since the time of ancient Greek philosophy (e.g., the Pygmalion effect), as with the call in positive psychology for attention to what is right and good about people to help restore more of a balance from the almost sole preoccupation with the negative and dysfunctional, there has also been an effort to refocus on the value of underrepresented positive psychological resources in the field of organizational behavior and human resource management (see Luthans, 2002). In particular, PsyCap, as defined in the introductory comments, has been researched mainly under the umbrella of positive organizational behavior and constitutes the inclusion domain of this meta-analysis.

Components of Psychological Capital. As stated, PsyCap has been demonstrated conceptually (Luthans, Youssef, & Avolio, 2007; Stajkovic, 2006) and empirically (Luthans, Avolio, et al., 2007) to be a core construct.

Specifically, it is a second-order factor comprised of the shared variance between the four recognized positive psychological resources of hope, optimism, efficacy, and resilience. Each of these positive constructs meet the criteria for PsyCap of being grounded in theory and research with valid measures, being state-like and open to development, and having a positive impact on attitudes, behaviors, and performance (Luthans, Youssef, et al., 2007). An extensive review of the four components is beyond the scope of this article, but this background can be found in separate chapters devoted to each of the four in Luthans, Youssef, et al. (2007); the components are briefly defined below. These definitions are then followed by the theoretical rationale for overall PsyCap and the study hypotheses are derived.

Hope is defined as “a positive motivational state that is based on an interactively derived sense of successful (1) agency (goal-directed energy) and (2) pathways (planning to meet goals)” (Snyder, Irving, & Anderson, 1991, p. 287). Optimism is depicted in positive psychology as both a positive future expectation open to development (Carver & Scheier, 2002) and an explanatory/attribution style interpreting negative events as external, temporary, and situation specific, and positive events as having opposite causes (i.e., personal, permanent, and pervasive) (Seligman, 1998). Drawing from Bandura (1997), efficacy is “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, 1998b, p. 66). Resilience is “the capacity to rebound or bounce back from adversity, conflict, failure, or even positive events, progress, and increased responsibility” (Luthans, 2002, p. 702).

The Theoretical Understanding of Psychological Capital. As indicated, PsyCap has been determined to be a second-order factor comprised of hope, optimism, resilience, and efficacy (Luthans, Avolio, et al., 2007). This means that PsyCap incorporates the mechanism(s) that these four discriminant constructs have in common. To explain this common content and process to date, the PsyCap literature has utilized Whetten, Felin, and King’s (2009) notion of “theory borrowing,” mainly drawing from psychological resource theory.

Specifically, Hobfoll’s (2002) psychological resource theory has been used to explain what PsyCap is and how it works. One aspect of this theory is that it suggests some constructs are best understood as indicators of broader underlying factors. That is, while an individual construct may be valid in terms of discriminant and predictive validity, it may be more beneficial to consider it as an indicator of something more core. Using this logic, popular constructs in the organizational behavior literature are often classified in this way. For example, while Judge and Bono (2001) recognized self esteem as a unique and valid construct, they suggested more can be learned than is currently known by considering it as an indicator of a broader construct they termed *core self evaluation traits*. This does not suggest self esteem is invalid, but rather positions it as one indicator of a second-order factor. The same logic was applied with

transformational leadership (e.g., Antonakis, Avolio, & Sivasubramaniam, 2003) and empowerment (Spreitzer, 1995), in that each are second-order factors comprised of shared variance between individual predictors.

By drawing from psychological resource theory, hope, optimism, efficacy, and resilience are presented in the theoretical understanding of PsyCap as having shared mechanisms between them. Even though they have been empirically demonstrated to be discriminant constructs (Luthans, Avolio, et al., 2007), there is more in common between them than different. In other words, PsyCap is what Law, Wong, and Mobley (1998) refer to as a multidimensional construct. This is also evident in how the components themselves are described in relation to each other. For example, Bandura (1998, p. 56) notes: "evidence shows that human accomplishments and positive well-being require an optimistic sense of personal efficacy to override the numerous impediments to success." He goes on to state that "Success usually comes through renewed effort after failed attempts. It is resiliency of personal efficacy that counts" (p. 62). When discussing hope and optimism, Snyder (2002, p. 257) notes that similar to hope, "optimism is a goal-based cognitive process that operates whenever an outcome is perceived as having substantial value."

The empirical evidence to date supports the multidimensional nature of PsyCap. In addition to relatively high correlations (0.6 to 0.7 range) and thus convergent validity between the components, using competing confirmatory factor analytic model comparisons, Luthans, Avolio, et al. (2007) found PsyCap was best modeled as a second-order factor. Specifically, the four components of PsyCap were modeled separately, in various combinations, and then in a model where they were fit to overall PsyCap. In each case, the model with PsyCap as a second-order factor fit the data the best. In subsequent studies, when conducting confirmatory factor analyses, the model with PsyCap as a second-order factor indicated by hope, optimism, efficacy, and resilience emerged as a superior fit to the data (e.g., Avey, Luthans, & Jensen, 2009; Avey, Luthans, & Youssef, 2010; Gooty, Gavin, Johnson, Frazier, & Snow, 2009; Luthans, Avey, Smith, & Li, 2008). Furthermore, Luthans, Avolio, et al. (2007) demonstrated the additive predictive validity of the composite PsyCap construct above and beyond its individual components in predicting performance and satisfaction. Thus, overall, psychological resource theory has been mainly used to date as the explanatory foundation and understanding of PsyCap as a core construct.

The Relationship Between PsyCap and Employee Attitudes. A number of studies have tested the relationship between PsyCap and various employee attitudes. In this meta-analysis, we have generated a two-dimensional typology of employee attitudes: those that are desirable and those that are undesirable to the goals of today's organizations. These two distinctions are not meant to be opposite ends of the broader attitudinal continuum but rather a categorization of attitudes. Each attitude (e.g., satisfaction and commitment) is meta-analyzed but listed in the tables based on this categorization. This distinction

between desirable and undesirable employee attitudes is meant to apply to most circumstances. For example, in this study, turnover intentions are considered an undesirable employee attitude. However, we recognize there may be exceptions, such as a low performer with high turnover intentions or in the case of a very low degree of functional turnover, for which allowing new input into an organization may be desirable. However, in general, most human resource managers would agree that when employees desire to quit, this is undesirable.

Previous research has suggested PsyCap is positively related to desirable employee attitudes and negatively related to undesirable employee attitudes. A primary explanatory mechanism for the effect of PsyCap on employee attitudes is that those higher in PsyCap expect good things to happen at work (optimism), believe they create their own success (efficacy and hope), and are more impervious to setbacks (resilience) when compared with those lower in PsyCap. Given the general expectancy of success derived from optimism and the belief in personal abilities derived from efficacy, those high in PsyCap report being more satisfied with their job (Luthans, Avolio, et al., 2007) and committed to their organizations (Luthans, Norman, Avolio & Avey, 2008). PsyCap can be argued to be related to commitment to the organization, because the organization (as a referent) fulfills needs for efficacy and accomplishment for those high in PsyCap. In turn, they are more likely to embed themselves and be enthusiastic about their work (engagement).

In addition to desirable attitudes, research has found PsyCap to be negatively related to undesirable employee attitudes, such as cynicism toward change or turnover intentions. Specifically, based on the optimistic expectancies of future events as well as resilience to setbacks, those higher in PsyCap have reported being more open and less cynical about change in their organizations. Further, Avey, Luthans, and Youssef (2010, p. 439) note: "PsyCap's agentic thinking has a motivating impact that can enhance internalization, determination, and pathways thinking, which contradict with the 'giving up' and despair associated with cynicism." Related to being less likely to give up is the notion that those high in PsyCap are less likely to have turnover intentions. For example, higher levels of optimism regarding the future and confidence in their ability to succeed in their current job will motivate them to take charge of their own destinies (Seligman, 1998), self-select into challenging endeavors (Bandura, 1997), engage the necessary efforts and resources, and persevere in the face of obstacles (Stajkovic & Luthans, 1998b), rather than become "quitters."

Finally, Bakker and Demerouti (2006) argue that holding job and personal resources constant, job demands will create distress on employees, leading to psychological exhaustion, anxiety, and impaired health. However, positive psychological resources, such as efficacy and optimism, counteract the distress from these demands, such that the components of PsyCap act as a suppressor of stress and anxiety. Using this argument, previous research has found negative

relationships between PsyCap and stress and anxiety (Avey, Luthans, & Jensen, 2009) as well as positive relationships with psychological well-being (Avey, Luthans, Smith, & Palmer, 2010). Overall, in this meta-analysis we anticipate PsyCap will have a positive relationship with desirable employee attitudes and a negative relationship with undesirable employee attitudes.

HYPOTHESIS 1: *PsyCap will be positively related to desirable employee attitudes.*

HYPOTHESIS 2: *PsyCap will be negatively related to undesirable employee attitudes.*

The Relationship Between PsyCap and Employee Behaviors. Previous research examining cognitive and behavioral management constructs have identified processes that underscore what Mobley, Griffeth, Hand, and Meglino (1979) refer to as the transitional link between them. Specifically, attitudes and/or behavioral intentions do not always manifest themselves into a clear observable behavior, but they often will (Fishbein & Ajzen, 1975). With the exception of performance behaviors and results, research linking PsyCap and behavioral outcomes have primarily included organizational citizenship behaviors (OCBs, what is here termed desirable employee behaviors) and counter-productive work behaviors (CWBs, often called deviance, herein referred to as undesirable employee behaviors). Despite the significant (negative) correlation between OCBs and CWBs, empirical findings support OCBs and CWBs as two distinct and orthogonal constructs, with different correlates and outcomes, rather than opposite ends of a single continuum (Sackett, Berry, Wiemann, & Laczko, 2006).

OCBs as work-related behaviors are discretionary, are not related to the formal organizational reward system, and, in the aggregate, promote the effective functioning of the organization (Organ, 1988). Lee and Allen (2002) further separate the behaviors into two referents. First, individual-oriented OCBs are those that use other employees in the organization as the referent point. This may include staying late on the job to help a coworker or supporting a newcomer to the group. The second referent for OCBs is the organization itself. Organizational OCBs are behaviors that support the macro-organization (vs. a person) directly. This may include attending organizational events that are not required or doing volunteer work in the community to indicate support from the employer. Referencing Fredrickson's (2003) broaden and build theory of positivity, it has been suggested employees who have high levels of positivity (PsyCap) would exhibit more OCBs than employees who tend to be negative. For example, Fredrickson's model supports a broadening contribution of positivity in which people utilize broader thought-action repertoires, increasing the potential for proactive extra-role behaviors such as sharing creative ideas or making suggestions for improvement.

Related to OCBs is the idea of undesirable CWBs. Specifically, Robinson and Bennett (1995, p. 556) define these deviance-oriented CWBs as "voluntary

behavior of organizational members that violates significant organizational norms, and in doing so, threatens the well-being of the organization and/or its members.” These may include major offenses, such as stealing, sabotaging, or bullying a fellow coworker, or relatively less offensive behaviors, such as publicly criticizing the organization or gossiping about a coworker.

To understand the negative relationship between PsyCap and CWBs, researchers have pointed to the origin of CWBs. In particular, Fox and Spector (1999) submit workplace constraints acting as stressors are the primary cause of CWBs. The process indicates that employees who are exposed to stressors in their environment (e.g., having to rely on incompetent colleagues in order to personally succeed) then may respond with CWBs due to these stressors (e.g., failing to help a coworker or sabotaging the operation). Given this, those higher in PsyCap would seem to be less likely to arrive at the CWB point in Fox and Spector’s process model, as their resilience may enable them to better deal with stressors preventing the onset of distress and frustration. Further, higher levels of hope may enable the employee to derive alternative pathways to overcome obstacles that otherwise act as stressors. Finally, if stressors do create distress, highly optimistic employees should continue to have positive expectations about future events. Optimists will expect the context will improve for them. Previous research found PsyCap can combat the stressors (Avey, Luthans, & Jensen, 2009), which in turn are less likely to generate the frustration that results in CWBs. Thus, the following hypotheses are advanced.

HYPOTHESIS 3: *PsyCap will be positively related to desirable employee behaviors.*

HYPOTHESIS 4: *PsyCap will be negatively related to undesirable employee behaviors.*

The Relationship Between PsyCap and Employee Performance. To date, performance has been the most researched outcome variable in research on PsyCap. This has included multiple types of performance (e.g., creative tasks, sales, referrals, quality and quantity of manufacturing, supervisor rated) and multiple sample characteristics (e.g., cross-sectional, service, manufacturing, and the highly educated). In each case, the theoretical position consistently advanced is that the mechanisms in the components of PsyCap act as individual motivational propensities and effort to succeed resulting in increasing performance output. To understand this effect on performance in a broader context, research has pointed to Campbell and colleagues (Campbell, McCloy, Oppler, & Sager, 1993), who proposed a comprehensive model of performance in which there are eight dimensions of predictors. These include: (1) job-specific task proficiency, (2) non-job-specific task proficiency, (3) written and oral communications, (4) demonstrating effort, (5) maintaining personal discipline, (6) facilitating peer and team performance, (7) supervision/leadership, and

(8) management/administration. In this case, PsyCap relates to employee performance mainly through the dimension of demonstrating effort. That is, overall, when employees try harder to succeed, they generally perform better. While motivated effort is not the only predictor of performance, Campbell and colleagues (1993) argue it is a very important predictor.

Individuals higher in PsyCap are likely to be energized and put forth effort that is manifested in higher performance over extended periods of time. This is because those higher in efficacy apply effort toward goals they personally believe they are capable of achieving. Further, they have willpower and generate multiple solutions to problems (hope), make internal attributions and have positive expectations about results (optimism), and respond positively and persevere in the face of adversity and setbacks (resilience). Overall, PsyCap should facilitate the motivation for intentional, agentic behavior toward successfully accomplishing goals and tasks leading to better performance than those lower in PsyCap. Thus, the final hypothesis is the following:

HYPOTHESIS 5: *PsyCap will be positively related to employee performance.*

Method

Inclusion Criteria. The inclusion criteria set for this study required that (1) PsyCap was quantitatively measured as a composite, core construct, and (2) PsyCap was quantitatively related to one or more of the outcome variables discussed above. Our goal was to achieve a full population of such defined PsyCap studies. Therefore, our search spanned all sources of studies, published and unpublished. Included studies were experimental, quasi-experimental, or correlational; conducted in both the United States and abroad; and were based on a wide variety of industry samples. Studies were excluded if containing only the theory of PsyCap or calls for additional research on PsyCap and if studies included only one or some of the four components of PsyCap.

Literature Search. Toward completing a comprehensive, exhaustive literature search, the term “psychological capital” was entered into the *PsycINFO* database (1874–present), *Ovid Medline*[®], *CINAHL*, *CCTR*, *Medline Non-Indexed*[®], *Old Ovid Medline*, *ProQuest Digital Dissertations*, and *ProQuest Advanced*. Once again, only studies that included the composite, core construct were included. Given that the most widely used measure of PsyCap is Luthans, Youssef, and Avolio’s (2007) Psychological Capital Questionnaire (PCQ), a cited reference search was performed using the databases for all research citing this scale. An Internet search for unpublished articles (e.g., www.google.com) and conference proceedings (e.g., Society for Industrial-Organizational Psychology) on PsyCap was also conducted. Lastly, we contacted more than 20 authors known to be pursuing research in PsyCap to obtain as yet unpublished study results or works currently “in press”. Citations in the reference section marked with an asterisk were included in this meta-analysis.

Results of our comprehensive search identified 51 independent samples (or primary studies) based on a total of 12,567 participants, which met our inclusion criteria. Of these, 15 were published journal articles, 2 were dissertations with results not yet published, and 28 consisted of new or as of yet unpublished data. Some of both the published and unpublished studies contained multiple independent samples and were therefore considered as multiple primary studies for purposes of this meta-analysis. The relatively high number of unpublished studies, of course, reflects the newness of the construct in the fields of organizational behavior, human resource management, and applied psychology.

Variable Coding. We will first describe how we coded for each of the variable categories discussed in our research questions and study hypotheses. A coding team of three subject-relevant doctoral student research assistants was formed and trained to conduct data extraction and coding from the studies. This training included a review of the coding scheme, practice coding an article independently, and discussion of any questions to clarify the coding scheme (e.g., What is considered a “manufacturing sample”?). During training, a series of studies were coded by all research assistants and discrepancies discussed and resolved. Percent agreement among the coders exceeded 90% and therefore, due to ease of coding, all additional studies were coded by one trained coder. In situations where the coder was unsure, one of the researchers was consulted until consensus was reached (i.e., 100% agreement).

PsyCap. As stated, PsyCap was only coded when all four core components (hope, optimism, efficacy, resilience) of PsyCap were included in a study and the aggregate reported. In a handful of studies when only one to three of the core components were included, those studies were not coded.

Outcome Variables. Most studies in this meta-analysis reported multiple outcomes of PsyCap. We coded outcome variables into the following five mutually exclusive categories: (1) desirable employee attitudes (job satisfaction, organizational commitment, and psychological well-being), (2) undesirable employee attitudes (cynicism, turnover intentions, and stress and anxiety), (3) desirable employee behaviors (organizational citizenship behaviors, performance), (4) undesirable employee behaviors (deviance), and (5) employee performance (self-ratings, supervisor evaluations, and objective measures). Other variables were tracked that did not fit these categories (e.g., leadership constructs such as transformational leadership, positive emotions), but insufficient data have been published to allow adequate meta-analysis (i.e., fewer than three correlations). Of the 51 independent primary studies, 22 effects came from the desirable employee attitudes, 13 from undesirable employee attitudes, 32 from desirable employee behaviors, 7 from undesirable employee behaviors, 24 from employee performance, and the remainder from a variety of other outcomes (e.g., positive emotions) that had insufficient numbers of effects to meta-analyze.

Moderators. In addition to coding for PsyCap and the outcome variables stated above, each study was coded for sample base (U.S.-based samples vs.

non-U.S.-based samples), sample type (student samples vs. working adult samples), and industry type (samples from manufacturing vs. samples from service), study methodology (laboratory vs. field), and type of performance measure (self ratings, manager/supervisor evaluations, or objective ratings).

Calculating the Effect Size Statistic (r). Our first analysis of the literature provided a comparison of all studies that fit our intervention criteria for each of the outcomes (desirable/undesirable employee attitudes, desirable/undesirable employee behaviors, and employee performance). Following this overall analysis, we then proceeded to examine a series of exploratory nonhierarchical analyses of the moderator variables listed above. These analyses were added to provide a more comprehensive examination of PsyCap impact for future reference, research, and theory building.

Given the focus on correlational studies, the r statistic was chosen as the effect statistic, with any t , r^2 , and other statistics transformed into the r statistic. For each study, all available correlations were coded for each separate dependent variable. In this way, we could extract all possible PsyCap effects from each study. This provided for a range of effect sizes that could be pulled from each dependent variable, enabling us to match the most appropriate effect from each study specifically to each of the hypotheses. It should be noted, however, that the assumption of independence was followed throughout every analysis such that each aggregated r was based on *only one* effect per sample. In the cases where more than one effect was reported per sample, those effects were first averaged before being meta-analyzed.

Rosenthal (1994) asserted that the correlation effect size has undesirable statistical properties and recommended transforming individual correlation effects to z -scores. However, we followed Hunter and Schmidt's (1990) recommendations based on the argument that transformed effects are upwardly biased and recommended using raw correlations.

The primary resource for our meta-analysis methodology comes from Hunter and Schmidt (2004). All meta-analysis calculations were computed using a spreadsheet specifically designed by the researchers for this study and based on formulas provided by Hunter and Schmidt. Additionally, to calculate and present utility analyses, we drew from Rosenthal and Rubin (1982) for the calculation and interpretation of binomial effect size display (BESD) statistics, and from Hedges and Olkin (1985) for homogeneity analysis (Q).

Data Assumptions and Decision Rules. Meta-analyses require numerous decision rules during coding and analysis, which ultimately affect the quality of the methodology and the interpretability of the findings. We established firm criteria for such judgment calls to enable informed interpretation of our findings (Wanous, Sullivan, & Malinak, 1989). Judgment calls in this meta-analysis were related to the following problems: dealing with missing data, maintaining the assumption of independence, correcting for study artifacts, and handling outliers.

Missing Data. To maximize the number of PsyCap effects calculated, two assumptions were made to minimize unusable data due to missing information. Studies that did not report a correlation matrix or statistics from which correlation coefficients could be determined (e.g., r^2 , t) were *not* automatically excluded; rather, in each case the author(s) were contacted and data requested along with any unpublished data or works in progress (i.e., to address the “file drawer issue”).

Assumption of Independence. Using the procedures described above, multiple PsyCap effects were often extracted from the same study and sample, for a total of 83 non-independent effect sizes. As noted above, to maintain sample independence, effect sizes from the same sample were averaged, yielding one independent effect per sample as recommended by Hunter and Schmidt (2004). Using these procedures, each analysis was based on independent samples (k).

Correction for Study Artifacts. According to Hunter and Schmidt (2004), the overall effect size is attenuated due to various study artifacts. We corrected for two of these artifacts throughout our meta-analysis: sampling error and measurement error. The most commonly accepted correction is for sampling error, based on the statistical principle that effects from larger samples are more accurate. For example, by weighting effects from larger samples more heavily, Hunter and Schmidt noted that the corrected overall effect size becomes closer to the true effect of leadership interventions.

Another issue with primary research that attenuates the overall effect size is measurement error or unreliability in the dependent measure (Hunter & Schmidt, 2004). Of the 78% of the studies that reported reliability estimates, the Cronbach's alpha coefficients ranged from a low of .68 to a high of .99. As the vast majority of the authors reported reliability estimates, we selected the correction method recommended by Hunter and Schmidt (2004). Mean reliability values were calculated for the PsyCap measure as well as measures of the dependent variables. For example, the mean reliability of the PsyCap measure across all studies in this meta-analysis was an alpha of 0.88, while the mean reliability for positive outcomes was alpha equal to 0.87 and for performance was alpha equal to 0.83. For those studies not reporting reliability, mean values were used to correct for unreliability in the measures. Thus, in the remainder of the discussion, we use “corrected” effect size to refer to the effect size corrected for *both* sampling error and unreliability in the dependent measure. For comparison purposes, both the raw and corrected effects are reported in the tables.

Outlier Analyses. Based on both effect size magnitude and sample size, outlier analyses were conducted on the overall set of data. According to Hunter and Schmidt (2004), extreme values may cause significant within-group heterogeneity of individual effect sizes that may not exist in reality. Furthermore, the weighted averages given to large sample size studies may cause the overall effect size to be influenced by a relatively few studies.

The first step in the search for extreme values was to compute histograms of the effect size and sample size values. From visual inspection of the histograms,

it was clear that some extreme values were present. We then implemented the three-sigma rule based on the recommendations for setting the statistical standard for selecting outliers, using both Kline's (1998) as well as Champ and Woodall's (1987) recommendations for cutoffs. Specifically, we treated those values more than three standard deviations above the mean as outliers. The cutoff value for effect sizes was 0.73, indicating two outliers ($r = 0.78$ and $r = 0.81$). With regard to extreme sample sizes, the cutoff value of three standard deviations above the mean was 791, indicating two additional outliers ($n = 899$ and $n = 833$). Small to moderate extreme values were retained in the analysis following Hunter and Schmidt's (2004) suggestion that these values may be simply due to large sampling errors, which we had previously corrected. Further, we examined the data before and after excluding the outliers and found no meaningful change in the results (e.g., $\Delta r = 0.01$).

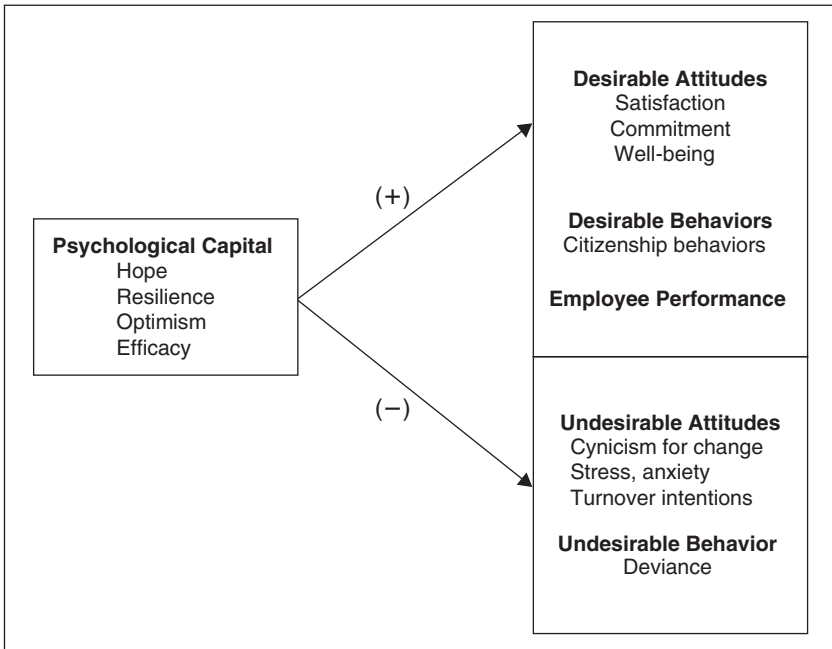
Moderators, Utility Analyses, and Confidence/Credibility Intervals. To go beyond the testing of hypotheses and to refine the results and to contribute to theory-building and practical guidelines, we also conducted moderator, utility and confidence/credibility interval analyses.

Moderator Analysis. There are several techniques that can be used to test for moderators, and the technique used may impact the conclusion of whether a moderator exists. Sagie and Koslowsky (1993) recommend using the Q test when there are either a large number of studies in the meta-analysis or a large number of participants per study. Given that both of those characterize the current study, homogeneity tests were conducted utilizing the Q significance test statistic to assess the effects of moderators (Hedges & Olkin, 1985). A significant Q statistic indicates the observed effect is heterogeneous and that there is a need to search for moderators to explain further variance in the findings. Each Q statistic reported on nonhierarchical research questions was computed independently of the others. Results of the Q statistic can be found in the tables.

Utility Analysis. Utility analysis gives meaning to the effect size by translating it into practical terms and, thereby, increases the ease of interpretation. The method used in this study is the Binomial Effect Size Display (BESD; Rosenthal & Rubin, 1982).

Confidence and Credibility Intervals. An additional strategy for interpreting significance and reliability of results was through an examination of confidence and credibility intervals. The 95% confidence interval provides a range of the effect sizes in which we can conclude with 95% probability that the true effect size falls within that range. In addition, if the 95% confidence interval excludes zero, we can conclude that the effect size is statistically and significantly different from zero ($p < 0.05$). Furthermore, the credibility interval size (i.e., range) has been stated as one technique to identify the possible existence of moderators. Koslowsky and Sagie (1993) suggested a rule of thumb that credibility intervals greater than 0.11 suggest the presence of moderators. However, this recommendation was limited to correlations less than 0.5, sample size of 100, and at least 20 independent samples/studies.

Figure 1. Proposed Relations Among Study Variables



Results

The proposed relationships with PsyCap can be seen in Figure 1. In the first hypothesis, we predicted that PsyCap would be positively related to desirable employee attitudes. As shown in Table 1, the correlation coefficients between PsyCap and the desirable work attitudes of satisfaction ($k = 10$, corrected $r = 0.54$, $sd = 0.17$), commitment ($k = 9$, corrected $r = 0.48$, $sd = 0.07$), and psychological well-being ($k = 3$, corrected $r = 0.57$, $sd = 0.16$) were large and all statistically significant with confidence intervals excluding zero. Therefore, results indicate full support for Hypothesis 1.

Next, we predicted a negative relationship between PsyCap and undesirable employee attitudes. Also shown in Table 1, Hypothesis 2 was also supported due to the significant negative correlations between PsyCap and the undesirable employee attitudes of cynicism ($k = 4$, corrected $r = -0.49$, $sd = 0.07$), turnover intentions ($k = 5$, corrected $r = -0.32$, $sd = 0.11$), and stress and anxiety ($k = 4$, corrected $r = -0.29$, $sd = 0.20$) with all confidence intervals excluding zero and thus statistically significant.

In the third and fourth hypotheses, we predicted a positive relationship between PsyCap and desirable employee behaviors and a negative relationship between PsyCap and undesirable employee behaviors. As shown in Table 2, results support the hypotheses with a strong, positive relationship

Table 1. Effect Sizes for PsyCap With Employee Attitudes

Sample	k	N	r	Corr-r	sd	95% Cred I		95% Conf I		Q	BESD Exp
						Lower	Upper	Lower	Upper		
Desirable attitudes											
Satisfaction	10	3,123	0.45	0.54	0.17	0.34	0.73	0.50	0.57	70.24**	0.77
Commitment	9	2,072	0.40	0.48	0.07	0.35	0.61	0.44	0.52	5.39*	0.74
Psych well-being	3	1,305	0.40	0.57	0.16			0.51	0.62	17.14*	0.78
Undesirable attitudes											
Cynicism	4	918	-0.46	-0.49	0.07			-0.55	-0.42	1.87	0.26
Turnover intent	5	2,650	-0.28	-0.32	0.11	-0.53	-0.10	-0.36	-0.28	19.4**	0.34
Stress/anxiety	4	1,459	-0.20	-0.29	0.20	-0.47	-0.10	-0.34	-0.24	28.71**	0.36

* $p < 0.05$, ** $p < 0.01$.

Note. Each k per row is based on independent samples; however, some authors reported data on multiple outcomes (e.g., effects for one sample on satisfaction, cynicism, and stress). Thus, the total k per table may be higher or lower than the total number of independent samples reported in this meta-analysis.

Table 2. Effect Sizes for PsyCap With Employee Behaviors and Performance

Sample	k	N	r	Corr-r	sd	95% Cred I		95% Conf I		Q	BESD Exp
						Lower	Upper	Lower	Upper		
Desirable behavior											
OCBs	8	2,319	0.43	0.45	0.15	0.41	0.50	0.41	0.49	32.28**	0.73
Performance	24	6,931	0.26	0.26	0.08	0.24	0.29	0.24	0.29	391.13**	0.63
Undesirable behavior											
Deviance	7	1,959	-0.43	-0.42	0.12	-0.49	-0.36	-0.47	-0.38	29.36**	0.29

* $p < 0.05$, ** $p < 0.01$.

Note. Each k per row is based on independent samples; however, some authors reported data on multiple outcomes (e.g., effects for one sample on OCBs, performance, and deviance). Thus, the total k per table may be higher or lower than the total number of independent samples reported in this meta-analysis.

between PsyCap and organizational citizenship behaviors ($k = 8$, corrected $r = 0.45$, $sd = 0.15$) and a strong, negative relationship between PsyCap and deviance ($k = 7$, corrected $r = -0.42$, $sd = 0.12$). Furthermore, all confidence intervals excluded zero indicating statistically significant effects.

Finally, with the fifth hypothesis, we predicted a positive relationship between PsyCap and employee performance. Once again, as shown in Table 2, results support this hypothesis with a positive, significant relationship between PsyCap and indicators of performance ($k = 24$, corrected $r = 0.26$, $sd = 0.08$). Given the potential variance in validity of different types of performance criteria, we further coded performance based on the data source. Specifically, Table 3 shows the meta-analytic results of the relationship between PsyCap and self-rated performance ($k = 6$, corrected $r = 0.33$), supervisor evaluations of performance ($k = 15$, corrected $r = 0.35$), and objective performance (e.g., sales, product rejects, engineering designs) ($k = 6$, corrected $r = 0.27$) indicating no meaningful difference between the three data sources of performance.

Of important note is that all but one (cynicism) of the Q statistics reported for effects in Tables 1 and 2 on the relationship between PsyCap and positive/negative employee attitudes and behaviors were statistically significant. Furthermore, the range of the credibility intervals in all these cases is much larger than the recommended rule of thumb cut-off of 0.11 recommended by Koslowsky and Sagie (1993). Taken together, these findings for the Q statistics indicate heterogeneous effects and the likelihood that significant moderators are operating in the data. Therefore, we conducted exploratory post hoc analyses to examine potential moderators based on sample base, sample type, and industry type.

Post Hoc Analyses. Saks and Ashforth (2000, p. 43) note: "One of the most important findings related to understanding work behavior is that individuals react differently to similar circumstances, and that to understand and predict behavior in organizational settings one needs to consider both person and situational factors as well as their interaction." Based on this interactionist perspective, exploratory post hoc moderator analyses were conducted to better understand "when" PsyCap mattered more (or less). Specifically, we examined the impact of PsyCap on overall positive outcomes across a variety of settings, including U.S. versus non-U.S. samples, student versus working adult samples, and manufacturing versus service samples with nonoverlap of confidence intervals indicating differences between moderator effects (see Table 4). First, we found that the impact of PsyCap on positive work outcomes was stronger for studies based in the U.S. ($k = 26$, corrected $r = 0.43$, $sd = 0.11$) than outside of the U.S. ($k = 7$, corrected $r = 0.24$, $sd = 0.09$). On the other hand, no differences were found between PsyCap's positive effects for student participants ($k = 5$, corrected $r = 0.38$, $sd = 0.09$) as compared to working adult participants ($k = 23$, corrected $r = 0.35$, $sd = 0.14$). Finally, PsyCap's impact was slightly larger in organizations based in the service industry

Table 3. Effect Sizes for PsyCap With Multiple Measures of Performance

Sample	k	N	r	Corr- r	sd	95% Conf I		Q	$BESD_{Exp}$
						Lower	Upper		
Self-ratings	6	1,921	0.31	0.33	0.18	0.29	0.37	15.24**	0.67
Supervisor evaluations	15	3,602	0.29	0.35	0.17	0.32	0.39		0.68
Objective data	6	1,768	0.26	0.27	0.15	0.23	0.32	18.43**	0.27

* $p < 0.05$, ** $p < 0.01$.

Note. Each k per row is based on independent samples; however, some authors reported data on multiple outcomes (e.g., effects for one sample on self-rated performance, supervisor evaluations of performance, and objective performance). Thus, the total k per table may be higher or lower than the total number of independent samples reported in this meta-analysis.

Table 4. Effect Sizes for PsyCap With Overall Positive Outcomes Across Moderators

Sample	k	N	r	Corr-r	sd	95% Conf I		Q	BESD Exp
						Lower	Upper		
Non-U.S. samples	7	2,289	0.22	0.24	0.09	0.20	0.28	15.74**	0.62
U.S. samples	26	4,631	0.38	0.43	0.11	0.40	0.46	50.79**	0.72
Student samples	5	1,187	0.32	0.38	0.09	0.33	0.44	5.82*	0.69
Working adult samples	23	5,085	0.33	0.35	0.14	0.32	0.37	101.65**	0.67
Manufacturing samples	4	1,224	0.26	0.29	0.06	0.24	0.35	1.62	0.65
Service samples	10	1,753	0.35	0.38	0.12	0.34	0.43	22.24**	0.69

* $p < 0.05$, ** $p < 0.01$.

Note. The k size for the various moderator categories analyzed is based on available data. In some cases, authors did not report the information needed to categorize the sample and that data was therefore not included in associated analysis (e.g., the author did provide information needed to code the sample as manufacturing or service).

($k = 10$, corrected $r = 0.38$, $sd = 0.12$) than in manufacturing ($k = 4$, corrected $r = 0.29$, $sd = 0.06$), with confidence intervals only overlapping by 0.01 (Manufacturing CI: 0.24–0.35 and Service CI: 0.34–0.43). These findings support the conclusion that sample base (U.S. vs. non-U.S.) and industry type are significant moderators that should be considered in future studies on PsyCap.

Discussion

Overall results of hypotheses tests suggest that the evidence accumulated over the past several years supports that PsyCap, as a second-order core factor comprised of hope, optimism, efficacy, and resilience, is significantly and strongly related to employee attitudes generally considered desirable by human resource management. These include job satisfaction, organizational commitment, and psychological well-being at work. Results also indicate that PsyCap is negatively related to attitudes considered undesirable, such as employee cynicism, turnover intentions, and employee stress and anxiety. Taken together, the accumulated evidence indicates employees' PsyCap is related to their attitudes in the strength and direction generally considered desirable for meeting the goals for effective human resource functioning in today's challenged organizations.

In addition to the significant association with employees' attitudes, results of this meta-analysis also suggest PsyCap is related to their behaviors. Specifically, and similarly to the method of separating attitudes in this study, results indicated that employees' PsyCap was positively related to their generally recognized desirable behaviors, such as organizational citizenship behaviors, and negatively related to their undesirable behaviors, such as deviance. Perhaps most importantly, by integrating 24 different samples, there was a significant relationship between employees' PsyCap and their performance. Overall, utility analysis indicates that the range of effects of PsyCap provides up to an additional 28% beyond chance of positive outcomes ($BESD = 0.78$ for psychological well-being) and up to a decrease of 24% in negative outcomes beyond chance alone ($BESD = 0.26$ for cynicism).

Besides the main effects of the meta-analysis, there were patterns across all individual studies that allowed for certain moderator analyses, which were performed post hoc, given there was no a priori hypotheses. Results from these analyses include a stronger relationship between PsyCap and work outcomes for U.S.-based samples as opposed to those outside the United States, which included samples from China, India, and Australia. Further, while effect sizes were relatively equal between student and working adult samples, there was a slightly stronger effect size for studies conducted in the service industry as compared to manufacturing. This latter finding suggests that PsyCap may be more important depending on the type of work being conducted. Specifically, PsyCap seems to have a stronger impact on service work, which relies on more social interactions that require emotional norms favoring the expression of positive

affect (Rafaeli & Sutton, 1987). In contrast, for manufacturing, mechanical and technical skills and knowledge may play a larger relative role in employee outcomes as opposed to drawing from psychological resources. Implicit in this argument is the role that PsyCap may have with the expression of positive emotions. We suggest this may be an important area for future research. In addition, future research should take heed of the moderators empirically found in this study and either control for sample base and industry type or report specific findings based on these moderators. More specifically, future studies should examine the relative relationship of PsyCap across types of jobs.

Another important finding was not only that PsyCap has a significant relationship with performance measured multiple ways, but that there was little difference whether this was self-reports, supervisor evaluations, or objective measures. Since the self-rating of performance showed about the same relationship with PsyCap as did other ratings (from supervisors/managers), there may not be as big a problem with same source bias issues with regard to PsyCap compared to other constructs. For example, a recent meta-analysis of the relationship between emotional intelligence and leadership found a validity estimate of 0.59 when ratings were provided by the same source, but dramatically dropped to 0.12 when the ratings were derived from different sources (Harms & Crede, 2010). Obviously, in future PsyCap research, objective measures of performance would be most valid, but at least in combination with other sources, self-ratings may make a contribution. The same may be said of social desirability problems when applied to positive constructs such as PsyCap. As Peterson and Seligman (2003, p. 8) observed, social desirability is "hardly a nuisance variable when one studies what is socially desirable."

Overall, the results from this study empirically support the initial propositions from about a decade ago of the value to employee attitudes, behavior, and performance of positive psychological resources (Luthans, 2002) and the positive impact when combined into psychological capital (Luthans & Youssef, 2004; Luthans, Youssef, & Avolio, 2007). In addition to confirming these previous propositions, a major contribution is providing meta-analytic evidence from all the research to date that PsyCap is a useful predictor of important employee outcomes in the workplace. These results confirm that PsyCap, which has been described as motivational propensity (Luthans, Avolio, et al., 2007), can lead to desirable employee attitudes, behaviors, and performance outcomes and help defuse undesirable attitudinal and behavioral outcomes. While this meta-analysis cannot lead to definitive conclusions that PsyCap causes these outcomes, several very recent experimentally designed studies have indicated such causal directionality (e.g., Avey, Avolio, & Luthans, in press; Luthans, Avey, Avolio, & Peterson, 2010; Norman, Avolio, & Luthans, 2010). Thus, PsyCap can at least preliminarily be considered a malleable, open-to-development individual difference variable (e.g., see Luthans, Avey, et al., 2010; Luthans, Avey, & Patera, 2008) and motivating mechanism in explaining employee attitudes, behaviors, and performance.

While this meta-analysis contributes to the nomological network of PsyCap, like all meta-analyses, interesting insights can also be gained from what was found missing. In other words, to reiterate, we undertook this meta-analysis at this relatively early stage of PsyCap theory-building and research in order to gain attention of its possible positive impact, take stock of where we are, and, most importantly, identify where future research is needed. Specifically, there were at least three major omissions from the PsyCap literature that provide opportunities for future research. First, we found very few studies that measured anything pertaining to the formation of PsyCap. In other words, few have considered what is “to the left” of PsyCap (i.e., the antecedents in a theoretical model). Recent research has suggested perhaps leadership plays a key role in developing follower PsyCap (Avey, Avolio, et al., in press) and that PsyCap can be enhanced by developmental interventions (Luthans, Avey, et al., 2010; Luthans, Avey, & Patera, 2008). However, there has been no systematic method of examining antecedents to PsyCap, which suggests this may be a fruitful area of future research. A second omission is testing moderators that help highlight when PsyCap may be more or less important or useful in the workplace. Although our analysis indicated job type and country culture may be moderators, multiple research questions are left unanswered such as in what other contexts, levels of analysis (group, organizational, and community), and even gender or work-life balance issues does PsyCap matter most or perhaps not at all.

A third area of omission is alternative methods (e.g., qualitative or mixed) and systematic theory linking primary antecedents of PsyCap with proximal and distal outcomes. More specifically, while previous research has effectively articulated what PsyCap is and how and why it manifests in the workplace (e.g., for a review see Luthans & Youssef, 2007; Stajkovic, 2006), it has not been consistently linked in a theoretical architecture to other variables (e.g., relationships, health) or underlying mechanisms and processes. While we are aware this theory-building is in progress, it has not yet been published. Overall, the substantial number of empirical studies conducted in a short period of time have been relatively narrow in scope. This leaves ample opportunity for future research to expand with other positive psychological resources such as courage or wisdom (see Luthans, Youssef, & Avolio, 2007, Chapters 6 and 7, that suggest other such resources for inclusion in PsyCap) and examine the extremes of those with especially high (or low) PsyCap and whether, as has been found with happiness (Diener & Biswas-Diener, 2008), there may be a curvilinear relationship between PsyCap and outcomes.

In addition to future research opportunities, there are also a number of practical implications, primarily revolving around HRD and performance management. As previously mentioned, PsyCap has been empirically found to be developable (Luthans, Avey, & Patera, 2008; Luthans, Avey, et al., 2010) even in relatively short training interventions (1–3 hours) and on line. Since results from this meta-analysis suggest PsyCap is related to important employee attitudes, behaviors, and performance, then HRD interventions such as those field-tested with experimental

designs (Luthans, Avey, et al., 2010; Luthans, Avey, & Patera, 2008), may be applied in HRD programs for potential increase in desirable employee outcomes back on the job (i.e., effective performance management). Future attention needs to be given to development of effective practice guidelines for such development (for example, types and frequency of follow-up feedback and coaching).

Before concluding, some of the limitations of the study need to be noted. One is that despite the fast-start growth of PsyCap research, there are still a relatively small number of studies to examine some of the hypotheses. In addition, with the exception of the multiple measures of employee performance discussed earlier, the studies on employee attitudes and behaviors almost solely relied on self-reported measures instead of manager- or other-reported outcomes. In addition to possible inflated relationships because of potential common source bias, which may partially explain the relatively high relationship between PsyCap and employee attitudes, it is also possible that there may be reverse causal relationships for the hypothesized relationships.

Another potential limitation is also due to the application of meta-analysis when there are only a limited number of studies to test any one hypothesis. There may be a number of moderating effects beyond what was analyzed here, making it difficult to draw definitive conclusions. Moreover, there were not enough studies presented here to assess the hierarchical (or interactive) effects of moderators on specific outcomes simultaneously (e.g., impact of PsyCap on a specific outcome in a specific industry).

Conclusion

Although critics have voiced concern over the underlying philosophy of positive organizational behavior, research on PsyCap has emerged relatively fast—the majority of empirical work has been published in the last two to three years. However, by doing a meta-analysis at this time, we tried to answer the common call found in all the articles in the recent special issue in the *Journal of Organizational Behavior* on “The Emerging Positive Agenda” (Wright & Quick, 2009) to assess where we are, at least with the core construct of psychological capital, so that future positive organizational behavior researchers, in the words of Hackman (2009, p. 318) “do their forward-looking work in a way that minimizes the likelihood of falling into the traps.” Results of this meta-analysis provide evidence-based support for the important role that PsyCap has in predicting employee attitudes, behaviors, and performance. Although the empirical research on PsyCap is still emerging, human resource managers in general, and especially those concerned with HRD, can be confident that at least at this stage of the research, PsyCap has a strong and significant relationship with established desirable outcomes, especially employee performance. Although the PsyCap journey seems off to a good start in the right direction, in order to reach its aspirational scientific and practical goals, there remains a need for more theory-building, research, and effective application.

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