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The empirical distinction of core self-evaluations and psychological capital and the identification of negative core self-evaluations and negative psychological capital☆

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ABSTRACT

Core self-evaluations (CSE) and Psychological Capital (PsyCap) each consist of four first-order dimensions, and the two constructs are strong predictors of personal and organizational outcomes. Despite their similarities, much is still unknown regarding the manner in which the two constructs are distinct. Also, while both constructs are described as positive attributes, the most popular CSE and PsyCap scales include items that represent negative attributes. We suggest that these items may represent two alternative constructs – Negative CSE and Negative PsyCap. Through a series of three studies, we address these research questions. We show that, although strongly related, the constructs of CSE and PsyCap represent two distinct factors, even when the scale instructions provide a common temporal stability and/or specificity. We also show that the two most popular CSE and PsyCap scales are best represented by four factors that represent CSE, PsyCap, Negative CSE, and Negative PsyCap. As two separate dimensions emerged for the items describing negative attributes, this finding suggests that the factors representing the negative items are more than artifactors alone. We discuss the implications of these findings in regards to the measurement of CSE and PsyCap as well as the future study of Negative CSE and Negative PsyCap.

1. Introduction

Core self-evaluations (CSE), defined as general and fundamental appraisals of the self, is a strong predictor of personal (i.e. well-being) and organizational outcomes (i.e. job satisfaction, performance; Ferris, Johnson, Rosen, & Tan, 2012; Judge, Bono, Erez, & Locke, 2005; Judge, Erez, Bono, & Thoresen, 2003). The construct is considered to be trait-like and resistant to change, and it consists of four dimensions (trait self-efficacy, self-esteem, emotional stability, and locus of control). Similarly, Psychological Capital (PsyCap), defined as appraisals of the self in regards to circumstances and the perceived likelihood of success, is a strong predictor of personal (i.e. well-being) and organizational outcomes (i.e. job satisfaction, performance; Culbertson, Fullagar, & Mills, 2010; Avey, Luthans, Smith, & Palmer, 2010a; Avey, Luthans, & Youssef, 2010b; Luthans, Avolio, Avey, & Norman, 2007a; Luthans, Youssef, & Avolio, 2007b). The construct is considered to be more state-like and readily open to development, and it consists of four dimensions (state self-efficacy, hope, optimism, and resilience).

While prior research has considered the two constructs as distinct, and some authors have suggested that PsyCap may be a mediator between CSE and valued outcomes (Avey, 2014; Luthans et al., 2007a, 2007b; Luthans, Youssef-Morgan, & Avolio, 2015), very few studies have empirically explored their relationship. Of those that have, results are often similar to Avey, Luthans, and Youssef (2010), who found a correlation of 0.72 between the two constructs but did not explore this relationship with more advanced methods and statistics, such as confirmatory factor analysis (CFA; Luthans et al., 2007a, 2007b; Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011). It is possible that the two constructs are empirically and structurally identical, and scales to measure CSE or PsyCap gauge the same construct. If the case, all prior investigations into the popular constructs of CSE and/or PsyCap may be misleading, and our understanding of positive human functioning may be inaccurate. Using a three-study process, we further test the relationship of CSE and PsyCap to ensure that they are distinct constructs. We also analyze the manner in which the two constructs are distinct, whether due to their differing temporal stability and/or specificity. Thus, even if the constructs are indeed distinct, the current studies still provides novel contributions to our understanding of CSE and PsyCap.

Additionally, both constructs are described as positive attributes, but the most popular CSE and PsyCap scales include items that represent

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negative attributes (Judge et al., 2003; Luthans et al., 2007a, 2007b). For instance, Judge et al.' (2003) CSE scale includes the items, "Sometimes I feel depressed" and "Sometimes when I fail I feel worthless." Items that gauge the absence of a construct may be appropriate reverse-coded representations of the construct, but the conceptual opposite of a construct is not the absence of the construct (Baumeister, Tice, & Hutton, 1989; Goldsmith, 1986; Tafarodi & Swann, 1995). While prior research on CSE and PsyCap considers these items to be reverse-coded representations of the two constructs (e.g. the absence of the construct), we suggest that these items do not actually gauge CSE and PsyCap. Instead, these items may gauge constructs that are distinct from CSE and PsyCap, which we label Negative CSE and Negative PsyCap. Negative CSE is defined as general, fundamental, and negative appraisals of the self, whereas Negative PsyCap is defined as negative appraisals of the self in regards to circumstance and the likelihood of success. Given these considerations, we provide an initial test of whether Negative CSE and Negative PsyCap are distinct from CSE and PsyCap.

In testing the existence of Negative CSE and Negative PsyCap, we explore possible new areas of research on negative self-evaluations and negative evaluations of one's environment, which may prove useful in obtaining a better understanding of human functioning. Perhaps more important, we provide further inferences about the validity of CSE and PsyCap as well as the validity of modern measures for gauging CSE and PsyCap – a call that has been made by others for CSE and PsyCap specifically (Dawkins, Martin, Scott, & Sanderson, 2013; Johnson, Rosen, & Djurdjevic, 2011b; Newman, Ucbasaran, Zhu, & Hirst, 2014) as well as the broader study of multidimensional constructs (Johnson, Rosen, & Chang, 2011a; Johnson, Rosen, Djurdjevic, & Taing, 2012; Law, Wong, & Mobley, 1998). If these measures are shown to have construct contamination and inadvertently gauge Negative CSE or Negative PsyCap in addition to CSE or PsyCap, future research should consider creating new scales for these constructs.

2. Background

Both, the higher-order (or multidimensional) constructs of CSE and PsyCap, include four first-order constructs that have a conceptual independence and empirically established discriminant validity. Each of these first-order constructs also have strong relationships with the other first-order constructs of their representative higher-order construct (Judge & Bono, 2001; Judge et al., 2003; Luthans et al., 2007a, 2007b). A strong set of correlations, however, is not sufficient for a grouping of constructs to be representative of a higher-order construct (Edwards, 2001; Johnson et al., 2012; Law et al., 1998). To form a higher-order construct, distinct but related constructs must also have a common theoretically-supported effect that links them together, and several such effects have been identified by prior authors (Edwards, 2001; Johnson et al., 2011a; Law et al., 1998).

The most common conceptualization of multidimensional constructs specifies three types: aggregate, latent, and profile models (Edwards, 2001; Johnson et al., 2012; Law et al., 1998). In research, the former two are much more popular than the third, and we only discuss these two. Aggregate constructs are created through the combination of lower-order constructs, such that causality flows from the lower-order constructs to the higher-order construct. Aggregate constructs are the combination of shared *and* unique variance in their lower-order constructs. For this reason, the lower-level constructs that compose aggregate constructs do not need to be strongly related (Johnson et al., 2011a). On the other hand, latent (or superordinate) constructs manifest as the lower-level constructs, such that causality flows from the higher-order construct to the lower-order constructs. Latent constructs are *only* the shared variance in their lower-order constructs. For this reason, the lower-order constructs that compose latent constructs should be strongly related. Prior research has considered both, CSE and PsyCap, to be latent constructs (Judge et al., 2003; Luthans et al., 2007a, 2007b). To define and study a latent construct, however, the common relation among the lower-order constructs must be identified.

In the case of CSE, Packer (Packer, 1985, 1985/1986) originally proposed that peoples' appraisals of themselves alter how they appraise the world, which prompted Judge, Locke, Durham, and Kluger (1998) to suggest that certain dispositional and fundamental assessments of the self may influence job satisfaction. To best represent these "dispositional and fundamental assessments of the self," Judge and Bono (2001)developed the concept of CSE. CSE is a multidimensional construct derived from evaluative, fundamental, and broad indicators (lower-order constructs; Chen, 2012; Zhang, Kwan, Zhang, & Wu, 2012). In other words, these indicators "involve evaluations of the self … are relatively stable and central to the self-concept … extend to all life domains" (Johnson et al., 2011a, p. 245). Based on this theoretical backing, Judge and Bono (2001)identified four indicators that they believed satisfied these requirements: trait self-efficacy, self-esteem, emotional stability, and locus of control. The authors also used this theoretical backing to identify constructs that do not satisfy these requirements. For instance, conscientiousness is a stable and important aspect of the self that extends to many life domains, but it is not evaluative and is more distal from the self-concept (Johnson et al., 2011a; Judge et al., 1998; Judge et al., 2003). Thus, the common theoretically-supported effect that links the constructs of CSE together is their relation to fundamental and broad evaluations of the self.

In the case of PsyCap, the construct arose from the early study of positive organizational behavior (Luthans & Youssef, 2007; Nelson & Cooper, 2007; Turner, Barling, & Zacharatos, 2002), which is defined as, "the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement" (Luthans, 2002, p. 59). Using this definition, Luthans et al. (2007a) sought constructs that represented these "positively oriented human resource strengths and psychological capacities," and they used the following criteria to do so:

> "(a) grounded in theory and research; (b) valid measurement; (c) relatively unique to the field of organizational behavior; (d) state-like and hence open to development and change as opposed to a fixed trait; and (e) have a positive impact on work-related individual-level performance and satisfaction" (p. 542).

Using this criteria, the constructs of hope, resilience, optimism, and self-efficacy were identified, and they were collectively believed to be representative of a broader higher-order construct of PsyCap. PsyCap itself, however, has a definition that is notably different than these inclusion criteria: "an individual's positive psychological state of development" (Luthans et al., 2007a, 2007b, p. 3). Even yet, Luthans et al. (2007a) also note that the "commonality or underlying link [of PsyCap] is a mechanism shared across each of the facets that contributes to a motivational propensity to accomplish tasks and goals" (p. 548). Taken together, we believe that the following description of PsyCap best represents these cumulative efforts to identify the common link between its respective first-order dimensions, "PsyCap, representing one's positive appraisal of circumstances and probability for success based on motivated effort and perseverance" (Luthans et al., 2007a, 2007b, p. 550), but we also note that PsyCap involves appraisals of the self in regards to circumstances and probability for success (Luthans & Youssef, 2007).

It is possible, however, that these justifications for the existence of CSE and PsyCap are one in the same. Both constructs involve evaluations and appraisals – whereas CSE involves evaluations of the self, PsyCap involves appraisals of the self in regards to the environment. As suggested by the work that CSE is founded upon (Packer, 1985, 1985/1986), evaluations of the environment are painted by evaluations and feelings of the self (Ferris et al., 2012; Judge et al., 2003). In turn, we suggest that the common variance between evaluations of the self (CSE) and

appraisals of the environment (PsyCap) may reflect peoples' underlying tendency to positively or negatively paint their appraisals, and the cognitive as well as emotional mechanisms that paint these appraisals may not greatly differ between the self and the self in regards to the environment. Further, definitions of PsyCap emphasize its relation with goals and motivation (Luthans & Youssef, 2007; Luthans et al., 2007a, 2007b). We also suggest that both constructs share this underlying link. Certain first-order constructs of CSE inherently involve goals and motivation, particularly self-efficacy (belief in one's ability to accomplish tasks) and locus of control (belief in the ability of internal or external sources to influence tasks), and the belief in one's ability to accomplish goals has long been considered to be a central part of the self (Bandura, 1977, 1986, 1994). Through tying PsyCap to goals and motivation, the construct may be also tied to these fundamental aspects of the self that are included within CSE. Thus, while prior definitions for CSE and PsyCap may emphasize different aspects of the self, we suggest that they may actually describe the same set of core processes and the interrelationship of these processes.

Additionally, in proposing CSE and PsyCap, both Judge and Bono (2001) as well as Luthans and Youssef (2007)seemed to "leave the door open" for other lower-order constructs to be included in the higher-order constructs. For instance, Luthans and Youssef (2007)noted that, "the positive psychological constructs that have been determined to meet the inclusion criteria *so far* include hope, resilience, optimism, and self-efficacy" (italics added, p. 542), and the authors' have more recently identified other constructs that may within the scope of PsyCap, such as mindfulness, authenticity, and courage (Luthans et al., 2015). Likewise, Johnson et al. (2011a) argue that the inclusion criteria for CSE is vague, causing authors to speculate about other lower-order constructs that could be added. The proposed inclusion criteria for CSE and PsyCap may not be as rigid as often believed, causing other constructs to be included – such as state self-efficacy, hope, optimism, and resilience in the case of CSE and trait self-efficacy, self-esteem, emotional stability, and locus of control in the case of PsyCap.

Further, certain first-order constructs of CSE and/or PsyCap may belong in the other higher-order construct. Indicators of CSE are evaluative, fundamental, and broad. Johnson et al. (2011a) note that optimism also fulfills these requirements, and the other dimensions of PsyCap may follow suit. Also, both multidimensional constructs include the first-order construct of self-efficacy. While CSE includes it as a trait and PsyCap includes it as a state, it is nevertheless important to note the conceptual overlap of the two constructs. Thus, while each of the eight first-order constructs may be distinct, the underlying effect that links them together may be the same. If this is the case, then CSE and PsyCap would not be entirely distinct.

In addition to theoretical similarities, prior empirical work also suggests that CSE and PsyCap may be repetitive. All research on the two constructs has shown a strong relationship (Avey, 2014; Peterson et al., 2011), and some studies have shown that their relationship may be as strong as traditional cutoffs for convergent validity (Hinkin, 1995, 1998). Avey et al., (2010b), for instance, found an observed correlation of 0.72 between CSE and PsyCap. Further, in Luthans and Youssef's (2007)initial development of the Psychological Capital Questionnaire (PCQ), the authors found a correlation of 0.60 between CSE and PsyCap. While not concerning in its own right, this correlation was stronger than that of PsyCap and optimism ($r = 0.57$) – a core component of PsyCap. Also, the measure used to gauge optimism in this study was used in the calculation of PsyCap, indicating that the "construct-total" correlation of Optimism and PsyCap may be smaller than the "construct-construct" correlation of CSE and PsyCap. Again, while strong relationships – even when the relationships are stronger than the component correlations – do not inherently indicate that constructs are repetitive, these prior results do indicate that the conceptual and empirical separation of CSE and PsyCap merits further investigation.

With these aspects taken into consideration, we propose the following research question:

Research Question 1a: Are CSE and PsyCap distinct constructs?

Additionally, it is entirely possible that CSE and PsyCap are indeed distinct, but the manner in which they are distinct may alter our understanding of the two constructs. Almost assuredly, the most often provided justification for the conceptual separation of CSE and PsyCap is their temporal stability. In Luthans et al. (2007a) initial identification of CSE and creation of a measure, the authors note, "the state-like nature of PsyCap also differentiates it from positively oriented organizational behavior trait-like constructs, such as the 'Big Five' personality dimensions or core self-evaluations" (p. 543), and they supported this notion by analyzing the test-retest correlations for PsyCap and other relevant constructs – including CSE. The results showed that conscientiousness ($r = 0.76$) and core self-evaluations ($r = 0.87$) had stronger test-retest correlations than PsyCap ($r = 0.52$) and positive emotions ($r = 0.46$), supporting the notion that CSE is a more stable personal characteristic compared to PsyCap. Since this initial study, authors have repeated these test-retest differences as evidence for the distinction between CSE and PsyCap (Luthans, Avey, Avolio, & Peterson, 2010; Luthans, Norman, Avolio, & Avey, 2008); however, we question whether this differing temporal stability is sufficient to label the constructs differently.

Constructs may be differentiated based on their temporal stability, such as trait and state self-esteem (Heatherton & Polivy, 1991; Howard, 2017; Leary & Baumeister, 2000). In these occurrences, researchers of personality and motivation theory (Kanfer, 1990; Locke & Latham, 2004; Martocchio & Judge, 1997) have long argued that trait-like constructs (i.e. CSE) are distal from personal and work outcomes (i.e. well-being, performance), but their effects are mediated by more proximal state-like constructs (i.e. PsyCap). These state-like constructs are often believed to emerge from relevant trait-like constructs, such that trait-like constructs determine the "baseline" of relevant state-like constructs and other personal and environmental factors may further determine the emergence of the state-like constructs (Heatherton & Polivy, 1991; Leary & Baumeister, 2000). Given prior research and theory, it is reasonable to believe that CSE is a trait-like construct that may partially determine the "baseline" of PsyCap.

As the temporal stability of CSE and PsyCap are the most often cited justification for their conceptual separation, it is possible that their *only* difference is their temporal stability – similar to trait and state self-esteem. CSE may only be trait-like PsyCap and/or PsyCap may only be state-like CSE. If this is the case, then prior research on CSE and PsyCap may be misleading. Particularly, authors have provided differing theoretical bases for the emergence and antecedents of CSE and PsyCap, such as the effect of leadership (Avey, 2014; Avey, Reichard, Luthans, & Mhatre, 2011; Ferris et al., 2012; Judge et al., 2003; Luthans et al., 2007a, 2007b); however, such theoretical differences may not actually exist. The actual relation of CSE and PsyCap may be much more direct and simple, similar to trait and state self-efficacy. Thus, we propose the following question:

Research Question 1b: Are CSE and PsyCap distinct constructs solely due to their differing temporal stability?

We note another possible source of distinction between CSE and PsyCap that has been sparsely discussed in prior research. CSE is *general* evaluations of the self, whereas PsyCap is *specific* to a particular domain (Judge & Bono, 2001; Luthans et al., 2007a, 2007b). While people can only have high or low CSE, they may high or low PsyCap in several different domains – such as work, family, or an uncountable list of others (Avey, 2014; Luthans, Luthans, & Luthans, 2004; Newman et al., 2014). Differences in specificity may sufficiently differentiate constructs, such as the case of general and organization-based self-esteem (Ferris, Brown, & Heller, 2009; Ferris, Lian, Brown, Pang, & Keeping, 2010; Pierce, Gardner, Cummings, & Dunham, 1989), but – if CSE and

PsyCap are only differentiated by their specificity – then it may be a misnomer and misleading to label the constructs differently. Instead, CSE may only be general PsyCap and/or PsyCap may only be specific CSE. Through conceptualizing the two constructs in this manner, their theoretical relation can be more clearly understood – but only if empirical evidence supports such a conceptualization. Thus, we propose the following question:

Research Question 1c Are CSE and PsyCap distinct constructs solely due to their differing specificity?

2.1. Negative CSE

In addition to testing whether CSE and PsyCap are distinct constructs, we also propose that certain aspects of the two constructs are distinct but have yet to be identified. Specifically, we propose the existence of Negative CSE and Negative PsyCap. Traditionally, CSE has been defined as general and fundamental evaluations of the self (Judge & Bono, 2001; Judge et al., 2003). In the vast majority of research, however, authors have conceptualized CSE as general, fundamental, and *positive* evaluations of the self. This is especially apparent in the four primary first-order constructs often used to represent CSE – trait self-efficacy, self-esteem, emotional stability, and locus of control. Many other evaluations of the self are general and fundamental but have yet to be included under the umbrella of CSE, and many of these constructs are *negative* evaluations of the self. The exclusion of these constructs, whether intentional or otherwise, has prevented a test of whether negative self-evaluations are distinct from positive self-evaluations. Because negative self-evaluations have yet to be analyzed alongside positive self-evaluations in the context of CSE, extant research is unable to show whether these negative self-evaluations form a distinct construct or whether they form a common construct with positive self-evaluations. Through ignoring negative evaluations, current research may have an incomplete understanding of fundamental and general evaluations of the self when studying CSE.

We define Negative CSE as fundamental, general, and negative evaluations of the self. In doing so, we shift the definition of CSE to fundamental, general, and positive evaluations of the self. It is possible that people may have generally positive or generally negative evaluations of themselves; however, it is also possible that people may simultaneously hold positive *and* negative evaluations of themselves. These positive and negative evaluations may even conflict, such as the case of dissonance (Festinger, 1962; Wicklund & Brehm, 2013), suggesting that positive and negative evaluations are not simply opposite sides of the same spectrum. In the current article, we do not attempt to identify the dimensions of Negative CSE. Instead, we only attempt to provide initial support for the emergence of the construct.

Further, prior research and theory also supports the existence of Negative CSE. Ferris et al. (2011) suggest that high and low CSE may relate to different outcomes, such that CSE is positively related to approach tendencies and negatively related to avoidance tendencies. The authors suggest that those high in CSE may be more sensitive to positive information, whereas those low in CSE may be more sensitive to negative information. Ferris et al. (2011) supported this notion through empirically demonstrating the relationship of CSE with the behavioral inhibition system, the behavioral activation system, approach work orientations, avoid work orientations, and other related personal characteristics.

We suggest that it is not high and low CSE that may relate to different outcomes, per se. Instead, Negative CSE may cause these observed differences between high and low CSE. Currently, the most popular method to gauge CSE is Judge et al.' (2003) scale. This scale consists of six positively-worded and six negatively-worded items, in which participants respond on a Likert scale. When participants report "high" CSE, they respond with high values to the positive items and low values to the negative items. Alternatively, when participants report "low" CSE, they respond with low values to the positive items and high values to the negative items. In this latter case, participants may not indicate a lack of CSE, but rather a lack of CSE *and* having Negative CSE. This would explain the differential effects of low CSE from high CSE, as it may actually reflect the impact of Negative CSE. Also, authors may have previously ignored instances in which participants responded with *both* high or *both* low CSE and Negative CSE, believing that the participants were simply reporting moderate CSE (as scale averages are analyzed). Thus, the previously observed differing relationships of high and low CSE may actually be the differing relationships of CSE and Negative CSE. In the current article, we empirically test the existence of Negative CSE through the following research question.

Research Question 2: Is Negative CSE empirically distinct from CSE?

2.2. Negative PsyCap

To our knowledge, no research has suggested differing effects for high and low PsyCap, and no research has incorporated negative first-order constructs into the multidimensional construct. This is reasonable, as the construct was developed from research in positive organizational behavior (Luthans et al., 2007a, 2007b). Nevertheless, we propose similar effects for PsyCap as CSE. We suggest the existence of Negative PsyCap, defined as negative appraisals of the self in regards to circumstance and the likelihood of success, and we test whether Negative PsyCap is conceptually and empirically distinct from PsyCap.

Research Question 3: Is Negative PsyCap empirically distinct from PsyCap?

3. Overview of studies

To test our research questions, we undergo a three-study process. Each study tests the distinctness of CSE and PsyCap using the two most popular measures for the constructs, but the studies differ in regards to the manner in which the measures are administered. In each of these studies, Research Questions 1a, 2, and 3 are tested. Research Question 1b is tested in Study 2 through altering the temporal frame-of-reference of the scales, and Research Question 1c is tested in Study 3 through altering the specificity of the scales.

4. Study 1

4.1. Method

4.1.1. Participants

The current study included 325 participants ($M_{age} = 35.69$, $SD_{age} = 11.16$, 43% female, 92% American; 100% employed) recruited from Amazon's Mechanical Turk (mTurk) in return for a small amount of monetary compensation. This website connects individuals willing to perform small tasks on their computer, such as taking a survey, with those who need these tasks performed. Previous studies have shown results using mTurk as valid (Buhrmester, Kwang, & Gosling, 2011; Paolacci & Chandler, 2014; Shapiro, Chandler, & Mueller, 2013). To ensure sufficient data quality, removed participants that failed an attention check. We also used a listwise deletion method to perform all analyses. No item had a missing rate >3%. All statistics, including demographic information, reflect the sample after these participants were removed.

4.1.2. Procedure

Participants signed-up for the study via mTurk. They provided their digital informed consent and completed the survey. Then, they were disclosed about the purpose of the study.

4.1.3. Measures

In the instructions for the CSE scale, participants were instructed to respond in regards to how they feel "in general." In the instructions for the PsyCap scale, participants were instructed to respond in regards to how they feel "at the present moment." For all studies, responses ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).

4.1.3.1. Core self-evaluations (CSE) Scale. CSE was measured using Judge et al.' (2003) 12-item scale ($\alpha = 0.90$) that includes six positively-worded and six negatively-worded items. An example item is, "I am confident I get the success I deserve in life."

4.1.3.2. PsyCap questionnaire (PCQ). PsyCap was measured using Luthans and Youssef's (2007) 24-item scale ($\alpha = 0.95$) that includes 21 positively-worded and 3 negatively-worded items. An example item is, "I feel confident analyzing a long-term problem to find a solution." Permission was obtained from Mindgarden, Inc. to administer the PCQ for all studies.

4.1.4. Results

To test the research questions, a four-step process was undertaken in which four different models were tested, as presented in Fig. 1. In each model, the four first-order factors of CSE (trait self-efficacy, self-esteem, emotional stability, and locus of control) and PsyCap (state self-efficacy, hope, optimism, and resilience) were modeled, and the following model descriptions refer to differences in the modeled second-order factors. First, a CFA was performed in which each of the CSE and PsyCap first-order factors loaded onto a single common factor. Second, a CFA was performed in which the first-order factors of the CSE and PsyCap scales loaded onto two different second-order factors – testing Research Question 1a. Third, a CFA was performed in which the CSE and PsyCap first-order factors loaded onto two different second-order factors, but each negatively-worded item was only forced to load onto a single latent factor. In this model, two first-order CSE factors were only represented by one item, thereby forcing their two respective items to load directly onto the second-order factor. Fourth, a CFA was performed in which the CSE and PsyCap first-order factors loaded onto two different second-order factors, but the negatively-worded items from the CSE scale only loaded onto a latent factor and the negatively-worded items from the PsyCap scale only loaded onto separate latent factors – testing Research Questions 2 and 3. Again, two first-order CSE factors were only represented by one item, thereby forcing their two respective items to load directly onto the second-order factor. Lastly, for the second, third, and fourth models, each second-order factor was allowed to covary.

Additionally, it should be noted that this procedure modeled CSE slightly differently than Judge et al.' (2003) creation of the CSE scale. In their study, the authors included four first-order factors for each dimension of CSE, but they forced the four dimensions to covary and fixed the covariances to one. While conceptually and empirically distinct from including a single first-order factor, this model was meant to represent a one-factor solution to their scale. In the current article, this could not be done because the presence of a common second-order factor prevents analyses from allowing the first-order factors to covary. Also, we believed that it would be inappropriate to have each item directly load onto an overall factor. In Luthans et al. (2007a) creation of the PCQ, the authors included four first-order factors for each dimension of PsyCap, and each first-order factor loaded onto a second-order factor. Having each item load directly on an overall factor would partially go against Judge et al.' (2003) conceptualization and completely go against Luthans and Youssef's (2007)conceptualization. Such analyses can be provided upon request, however. Lastly, these procedures model CSE very similarly to Johnson et al. (2011b) investigation into the construct's factor structure, which followed prior recommendations for analyzing multidimensional constructs (Edwards, 2001; Johnson et al., 2011a; Law et al., 1998). With these factors taken into consideration, we believe that our provided analyses are the most appropriate for our research questions.

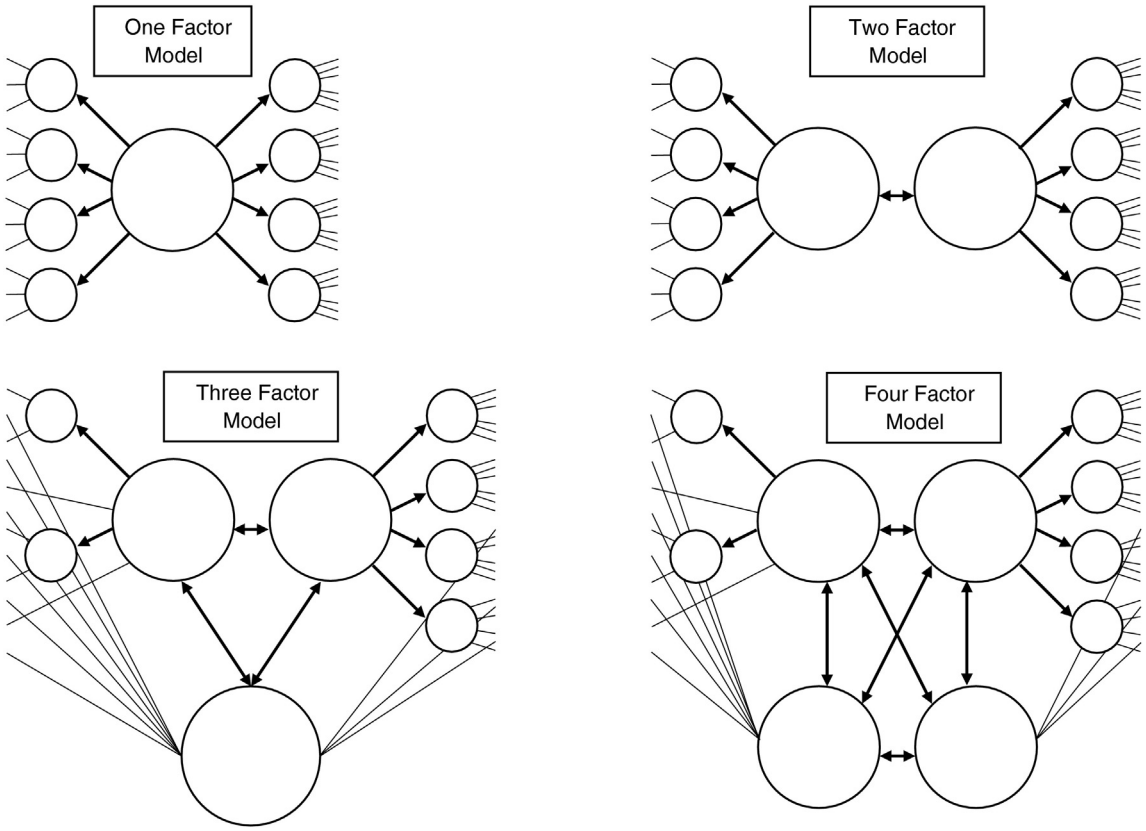

Fig. 1. – Visual Representation of One, Two, Three, and Four Factor Models.

Table 1
– Study 1 Model Fit Indices.

	SRMR	NFI	CFI	AIC	BIC	χ^2	*df*
1.) One Overall Factor	0.08	0.77	0.82	2233.345	2536.051	2073.345	586
2.) Two Overall Factors	0.07	0.79	0.84	2111.007	2417.497	1949.007	585
3.) Two Positive & One Negative Factors	0.06	0.83	0.89	1681.919	1988.408	1519.919	585
4.) Two Positive & Two Negative Factors	0.06	0.84	0.90	1579.268	1897.110	1411.268	582
Alternative Model Three	0.05	0.84	0.90	1632.531	1980.643	1448.531	574
Alternative Model Four	0.05	0.85	0.91	1531.256	1890.720	1341.256	571

Overall fit indices for each model are included in Table 1. The first model, including a single second-order factor, had a relatively poor fit to the data (SRMR = 0.08, CFI = 0.82, AIC = 2233, χ^2 = 2073, df = 586), but each item had a satisfactory standardized item loading (>0.45). The second model, with two second-order factors, had substantially better fit when compared to this model (SRMR = 0.07, CFI = 0.84, AIC = 2111, χ^2 = 1949, df = 585). Because the models are non-nested, we cannot directly compare model fit improvements via χ^2 changes. Nevertheless, the other fit indices can be used to compare non-nested models, particularly the AIC values. Prior studies have suggested that differences as small as four in AIC values represent significant improvements to model fit, with smaller values representing better model fit (Burnham & Anderson, 2004; Raftery, 1995). As the second model had a 122 smaller AIC value, it is safe to say that the second model is a significant improvement beyond the first. Also, all items still loaded well (>0.44). The correlation between the two factors was 0.87 ($p < 0.01$). While strongly related, the two constructs appear to be distinct (Research Question 1a).

The third model, with a latent variable predicting all negatively-worded items, likewise had substantially better fit when compared to the second model (SRMR = 0.06, CFI = 0.89, AIC = 1681, χ^2 = 1519, df = 585), as indicated by the much smaller AIC value. As the third model had a 430 smaller AIC value, it is safe to say that the third model is a significant improvement beyond the second. Most items had significant factor loadings, including those that loaded onto the negative item factor (>0.50). The correlation was 0.91 between CSE and PsyCap, −0.78 between the CSE and negative item factor, and −0.69 between the PsyCap and negative item factor.[1]

The fourth model, which included two separate latent variables predicting the negatively-worded items, also had substantially better fit when compared to the third model (SRMR = 0.06, CFI = 0.90, AIC = 1579, χ^2 = 1411, df = 582), as indicated by the much smaller AIC value. As the fourth model had a 103 smaller AIC value, it is safe to say that the fourth model is a significant improvement beyond the third. Again, all items still had significant factor loadings, including those that loaded onto the negative item factor (>0.50). The correlation was 0.91 between the CSE and PsyCap factor, −0.78 between the CSE and negative CSE factor, −0.55 between the CSE and negative PsyCap factor, −0.68 between the PsyCap and negative CSE factor, −0.53 between the PsyCap and negative PsyCap factor, and 0.71 between the negative CSE and the negative PsyCap factor. These factor correlations are presented in Table 2. Together, these results suggest that a four-factor second-order solution, with two positive-item factors and two negative-item factors, was the best model to describe the latent structure of the CSE and PsyCap items – providing clear inferences about Research Questions 2 and 3.

Lastly, two additional models were tested to address certain alternative explanations for the observed results. These two models were the same as the third and fourth models above, but each negatively-worded item loaded onto the CSE and PsyCap latent factors as well as their respective negative latent factor. The results again showed that the four-factor model (AIC = 1531) was a better fit than the three-factor model (AIC = 1632), further supporting that the negatively-worded items represent two substantive factors rather than an artifactor alone.

4.2. Study 1 discussion

The results of Study 1 provide several inferences. While the two factors of CSE and PsyCap were strongly related (0.91), the two-factor model fit better than the one-factor model. This suggests that the two factors are indeed distinct, addressing Research Question 1a, but the constructs may produce few relationships independent of the other – a consideration detailed in the general discussion. When further analyzing this two-factor model, the overall model fit was relatively poor, suggesting that other un-modeled factors may explain a significant portion of the variance in the CSE and PsyCap scales. The three-factor model confirmed that this was the case, as the model fit was a very large improvement beyond the two-factor model. Lastly, the addition of a second negative factor significantly improved model fit, again, suggesting that Negative CSE and Negative PsyCap are likely distinct from CSE and PsyCap.

Further, another aspect of Model 4 should be noted that provides additional support for Negative CSE and Negative PsyCap. Previously, authors have studied the potential biasing effect of negatively-worded items through modeling a single latent factor for all negatively worded items (Marsh, 1996; Marsh, Byrne, & Craven, 1992). Model 4 demonstrated that two factors were a better fit than the single factor for modeling the negatively-worded items. This indicates that the underlying relationship of the items is more than their valiance alone (i.e. an artifactor), and their interrelationship may be two similar but distinct constructs. We suggest that these two constructs are Negative CSE and Negative PsyCap. Together, the results support the existence of Negative CSE and Negative PsyCap, addressing Research Questions 2 and 3.

With these results in mind, the current article further tests the three research questions – and two others. Study 1 administered the CSE and PsyCap scales as they are most commonly administered in research, asking participants to respond in regards to how they feel "in general" (CSE) or "at the present moment" (PsyCap). It is possible, however, that the constructs of CSE and PsyCap themselves are distinct solely due to their differing temporal stability (Research Question 1b). To address this possibility, we perform a second study in which participants are *not* instructed to respond in regards to how they feel "in general" or "at the present moment." Instead, they are given vague instructions

Table 2
– Study 1 Factor Correlations in Model 4.

	1	2	3	4
1.) CSE	–			
2.) PsyCap	0.91	–		
3.) Negative CSE	−0.78	−0.68	–	
4.) Negative PsyCap	−0.55	−0.53	0.71	–

[1] The negatively-worded items were reverse coded to aid in interpretation. For this reason, the results initially indicated that all three factors were positively-related, but we report the negative factor as being as negatively-related to the other two in order to "un-reverse code" the items. We did the same in regards to the negative factors in all following analyses.

Table 3
– Study 2 Model Fit Indices.

	SRMR	NFI	CFI	AIC	BIC	χ^2	*df*
1.) One Overall Factor	0.08	0.76	0.82	2107.808	2410.514	1947.808	586
2.) Two Overall Factors	0.08	0.77	0.83	2005.331	2311.821	1843.331	585
3.) Two Positive & One Negative Factors	0.07	0.80	0.86	1809.602	2116.091	1647.602	585
4.) Two Positive & Two Negative Factors	0.06	0.82	0.88	1667.334	1985.175	1499.334	582
Alternative Model Three	0.07	0.81	0.87	1751.393	2099.505	1567.393	574
Alternative Model Four	0.06	0.83	0.89	1622.820	1982.284	1432.820	571

that do not specify a temporal frame-of-reference. If the dimensions of CSE and PsyCap still emerge, then Study 2 will indicate that more than the differing temporal stability of the two constructs may be the cause of their distinction. Also, Study 2 again provides further tests of the emergence of Negative CSE and Negative PsyCap.

5. Study 2

5.1. Method

5.1.1. Participants

The current study included 325 participants[2] (M_{age} = 35.03, SD_{age} = 10.63, 41% female, 85% American; 100% employed) recruited from mTurk in return for a small amount of monetary compensation. To ensure sufficient data quality, we removed participants that failed the attention check. We also used a listwise deletion method for all analyses. No item had a missing rate >2%. All statistics reflect the sample after removing these participants.

5.1.2. Procedure

Participants signed up for the study via mTurk. They provided their digital informed consent and completed the survey. Then, they were disclosed about the purpose of the study.

5.1.3. Measures

The same CSE and PsyCap questionnaires for Study 1 were administered in Study 2. Instead of including their typical instructions that instruct participants to respond how they feel "in general" (CSE) or "in the present moment" (PsyCap), the instructions only told participants to provide their fullest attention and to answer as truthfully as possible.

5.1.4. Results

To test the proposed research questions, the same four-step SEM process from Study 1 was undertaken (Fig. 1). Overall model fit indices are included in Table 3.

The first model, including a single second-order factor, had a relatively poor fit to the data (SRMR = 0.08, CFI = 0.81, AIC = 2108, χ^2 = 1948, df = 586). Each item loaded well (>0.40), except a single psychological capital item (Item 23 = 0.30). The second model, with two second-order factors, had substantially better fit when compared to this model (SRMR = 0.08, CFI = 0.83, AIC = 2005, χ^2 = 1843, df = 585), as indicated by the much smaller AIC value. As the second model had a 103 smaller AIC value, it is safe to say that the second model is a significant improvement beyond the first. Also, almost all items still had satisfactory standardized factor loadings (>0.39), except for the single PsyCap item (Item 23 = 0.30). The correlation between the two factors was 0.86 ($p < 0.01$). While strongly related, the two constructs again appear to be distinct, addressing Research Questions 1a and 1b.

The third model, with a latent variable predicting all negatively-worded items, likewise had substantially better fit when compared to the second model (SRMR = 0.07, CFI = 0.86, AIC = 1809, χ^2 = 1647, df = 585), as indicated by the much smaller AIC value. As the third model had a 195 smaller AIC value, it is safe to say that the third model is a significant improvement beyond the second. Most items still had significant factor loadings, including those that loaded onto the negative item factor (>0.50), but two PsyCap items had loadings of 0.35 and 0.42 onto the negative factor. The correlation was 0.90 between the CSE and PsyCap factor, −0.78 between the CSE and negative item factor, and −0.71 between the PsyCap and negative item factor.

The fourth model, which included two separate latent variables predicting the negatively-worded items, also had substantially better fit when compared to the third model (SRMR = 0.06, CFI = 0.88, AIC = 1667, χ^2 = 1499, df = 582), as indicated by the much smaller AIC value. As the third model had a 143 smaller AIC value, it is safe to say that the fourth model is a significant improvement beyond the third. With both negative factors modeled, all items again had significant factor loadings, including those that loaded onto the negative item factors (>0.50). The correlation was 0.90 between the CSE and PsyCap factor, −0.78 between the CSE and negative CSE factor, −0.45 between the CSE and negative PsyCap factor, −0.70 between the PsyCap and negative CSE factor, −0.49 between the PsyCap and negative PsyCap factor, and 0.54 between the negative CSE and the negative PsyCap factor.[3] These correlations are presented in Table 4. Together, these results suggest that a four-factor second-order solution, with two positive-item and two negative-item factors, was the best model to describe the latent structure of the CSE and PsyCap items – providing clear inferences about Research Questions 2 and 3.

Lastly, two additional models were tested to address certain alternative explanations for the observed results. These two models were the same as the third and fourth models above, but each negatively-worded item loaded onto the CSE and PsyCap latent factors as well as their respective negative latent factor. The results again showed that the four-factor model (AIC = 1622) was a better fit than the three-factor model (AIC = 1751), further supporting that the negatively-worded items represent two substantive factors rather than an artifactor alone.

5.2. Study 2 discussion

Again, the two factors of CSE and PsyCap were strongly related (0.90), but the two-factor model fit better than the one factor model. The two constructs are distinct even with an identical temporal frame-of-reference, providing a conservative investigation into Research Question 1a and allowing inferences into Research Question 1b. The temporal stability of CSE and PsyCap does not appear to be the sole cause of the two constructs' distinctness from each other.

Additionally, the fit of the two-factor model was relatively poor in Study 2, similar to Study 1. When the single negative factor was included in the model, model fit substantially improved – again more so than the addition of separate CSE and PsyCap factors. Likewise, the model fit

[2] This number is correct. Study 2 had the same number of participants as Study 1, and the two studies had distinct sets of participants. That is, the participants for Study 2 were not the same group from Study 1.

[3] Again, these results were "un-reverse-coded."

Table 4
– Study 2 Construct Correlations in Model 4.

	1	2	3	4
1.) CSE	–			
2.) PsyCap	0.90	–		
3.) Negative CSE	−0.78	−0.70	–	
4.) Negative PsyCap	−0.45	−0.49	0.54	–

improved even further when the second negative factor was included in the model, which provides further support that Negative CSE and Negative PsyCap may be distinct constructs from CSE and PsyCap – addressing research Questions 2 and 3.

With these results in mind, the current article even further studies the research questions – including Research Question 1c. Judge et al.' (2003) CSE scale is a general measure of personal evaluations, whereas Luthans and Youssef's (2007) PsyCap scale is specific to the workplace. For instance, the CSE scale includes the item, "When I try, I generally succeed," to gauge trait self-efficacy, whereas the PsyCap scale includes the item, "I feel confident helping to set targets/goals in my work area," to gauge state self-efficacy. While the two constructs may be distinct in their own right, it is also possible that the two constructs are distinct only because of their differing specificity. In Study 3, we provide scale instructions that ask participants to respond in regard to how they feel "at work," causing participants to have a more consistent specificity for the two scales.

Further, Study 2 provides a more so conservative test of CSE and PsyCay by using a common temporal frame-of-reference in addition to a common specificity, and it also provides further tests of the emergence of Negative CSE and Negative PsyCap.

6. Study 3

6.1. Method

6.1.1. Participants

The current study included 325 participants[4] (M_{age} = 35.87, SD_{age} = 10.76, 47% female, 88% American; 99% employed) recruited from mTurk in return for a small amount of monetary compensation. To ensure sufficient data quality, we removed participants that failed the attention check. We also used a listwise deletion method for all analyses. No item had a missing rate >2%. All statistics reflect the sample after removing these participants.

6.1.2. Procedure

Participants signed-up for the study via mTurk. They provided their digital informed consent and completed the survey. Then, they were disclosed about the purpose of the study.

6.1.3. Measure

The same CSE and PsyCap questionnaires for Study 1 were administered in Study 2. Instead of including their typical instructions that instructs participants to respond how they feel "in general" (CSE) or "in the present moment" (PsyCap), the instructions did not provide any temporal frame-of-reference. The instructions did, however, instruct participants to respond to the items in regards to how they feel "at work" to provide a common specificity.

[4] This number is correct. Study 3 had the same number of participants as Studies 1 and 2, and the three studies had distinct sets of participants. That is, the participants for Study 3 were not the same group from Study 1 and 2.

6.2. Results

To test the proposed research questions, the same four-step SEM process from Studies 1 and 2 was undertaken (Fig. 1). Overall model fit indices are included in Table 5.

The first model, including a single second-order factor, had a relatively poor fit to the data (SRMR = 0.07, CFI = 0.84, AIC = 2000, χ^2 = 1840, df = 586). Each item loaded well (>0.44). The second model, with two second-order factors, had substantially better fit when compared to this model (SRMR = 0.06, CFI = 0.85, AIC = 1943, χ^2 = 1781, df = 585), as indicated by the much smaller AIC value. As the second model had a 57 smaller AIC value, it is safe to say that the second model is a significant improvement beyond the first. Also, almost all items still had satisfactory standardized factor loadings (>0.43). The correlation between the two factors was 0.92 ($p < 0.01$). While strongly related, the two constructs again appear to be distinct, addressing Research Questions 1a, 1b, and 1c.

The third model, with an included latent variable predicting all negatively-worded items, likewise had substantially better fit when compared to the second model (SRMR = 0.06, CFI = 0.88, AIC = 1693, χ^2 = 1531, df = 585), as indicated by the much smaller AIC value. As the third model had a 250 smaller AIC value, it is safe to say that the third model is a significant improvement beyond the second. All items still had significant factor loadings, including those that loaded onto the negative item factor (>0.50). The correlation was 0.94 between the CSE and PsyCap factor, −0.77 between the CSE and negative item factor, and −0.74 between the PsyCap and negative item factor. These results provide initial inferences about Research Questions 2 and 3.

The fourth model, which included two separate latent variables predicting the negatively-worded items, also had substantially better fit when compared to the third model (SRMR = 0.05, CFI = 0.89, AIC = 1652, χ^2 = 1485, df = 582), as indicated by the much smaller AIC value. As the third model had a 40 smaller AIC value, it is safe to say that the fourth model is a significant improvement beyond the third. Again, most items still had significant factor loadings, including those that loaded onto the negative item factor (>0.50). The correlation was 0.94 between the CSE and PsyCap factor, −0.78 between the CSE and negative CSE factor, −0.61 between the CSE and negative PsyCap factor, −0.73 between the PsyCap and negative CSE factor, −0.65 between the PsyCap and negative PsyCap factor, and 0.79 between the negative CSE and the negative PsyCap factor.[5] These correlations are presented in Table 6. Together, these results suggest that a four-factor second-order solution, with two positive-item factors and two negative-item factors, was the best model to describe the latent structure of the CSE and PsyCap items – providing clear inferences about Research Questions 2 and 3.

Lastly, two additional models were tested to address certain alternative explanations for the observed results. These two models were the same as the third and fourth models above, but each negatively-worded item loaded onto the CSE and PsyCap latent factors as well as their respective negative latent factor. The results again showed that the four-factor model (AIC = 1613) was a better fit than the three-factor model (AIC = 1583), further supporting that the negatively-worded items represent two substantive factors rather than an artifactor alone.

6.3. Study 3 discussion

Again, the two factors of CSE and PsyCap were strongly related (0.94), but the two-factor model fit better than the one factor model. The two constructs appear distinct even with an identical temporal frame-of-reference and specificity, providing a more conservative investigation into Research Questions 1a and 1b as well as allowing inferences into Research Question 1c. The specificity of CSE and PsyCap does

[5] Again, these results were "un-reverse-coded."

Table 5
– Study 3 Model Fit Indices.

	SRMR	NFI	CFI	AIC	BIC	χ^2	*df*
1.) One Overall Factor	0.07	0.79	0.84	1999.760	2302.466	1839.760	586
2.) Two Overall Factors	0.06	0.79	0.85	1943.164	2249.654	1781.164	585
3.) Two Positive & One Negative Factors	0.06	0.82	0.88	1692.629	1999.118	1530.629	585
4.) Two Positive & Two Negative Factors	0.05	0.83	0.89	1652.931	1970.773	1484.931	582
Alternative Model Three	0.05	0.83	0.89	1613.254	1961.366	1429.254	574
Alternative Model Four	0.05	0.84	0.90	1583.429	1942.892	1393.429	571

not appear to be the sole cause of the two constructs' distinctness. Further, the one-factor model in Study 3 was a better fit than the one-factor model in Studies 1 and 2. While the specificity is not the sole cause of the empirical distinction between the two constructs, it certainly affects the observed differences between CSE and PsyCap. Also, the observed correlation between the CSE and PsyCap factors did not greatly vary between Studies 1 and 2 with Study 3, likely due to their already strong relationship.

Additionally, the fit of the two-factor model was relatively poor in Study 3, similar to Studies 1 and 2. When the single negative factor was included in the model, model fit substantially improved – again more so than the addition of separate CSE and PsyCap factors. Likewise, the model fit improved even further when the second negative factor was included in the model, which provides further support that Negative CSE and Negative PsyCap may be distinct constructs from CSE and PsyCap – addressing research Questions 2 and 3.

7. General discussion

The current article had four primary goals. The first was to empirically show that CSE and PsyCap are distinct constructs (Research Question 1a). The second was to determine the manner in which the two constructs are distinct (Research Questions 1b and 1c). The third was to provide initial support for the existence of Negative CSE (Research Question 2). The fourth was to provide initial support for the existence of Negative PsyCap (Research Question 3). We showed that the two most common scales to gauge CSE and PsyCap produced two distinct latent factors via CFA, suggesting that CSE and PsyCap are distinct constructs. These two constructs still emerged when altering the temporal frame-of-reference and the specificity of the scales, suggesting that the constructs' temporal stability and specificity are not the sole cause of their distinctness. We also showed that adding two additional latent factors, one for the negatively-worded CSE items and one for the negatively-worded PsyCap items, significantly improved model fit beyond the originally intended two latent factors for the scales – and even a three-factor solution including a negative-wording factor. This results suggested that the common underlying factor among these items was more than simply their negative wording (i.e. artifactors). If the common link between these items was an artifactor, then we would expect only one factor to emerge for all negatively-worded items. Instead, two separate substantive constructs emerged from the negative items in the CSE and PsyCap scales – thereby providing initial support for the existence of Negative CSE and Negative PsyCap. These results have several important implications, which may open several avenues for future research.

Table 6
– Study 3 Construct Correlations in Model 4.

	1	2	3	4
1.) CSE	–			
2.) PsyCap	0.94	–		
3.) Negative CSE	−0.78	−0.73	–	
4.) Negative PsyCap	−0.61	−0.65	0.79	–

7.1. Implications

Prior authors have discussed the theoretical link between CSE and PsyCap, but no research to our knowledge has explored this link in depth. The current article provided robust evidence that the two constructs are indeed distinct. Even under extremely conservative tests of their distinctness, Studies 2 and 3, two constructs emerged for each of the CSE and PsyCap scales, and research should no longer question whether the two constructs are one in the same. Further, we showed that the source of the constructs' distinctness goes beyond their differing temporal stability and specificity. These results prompt the following question: If the temporal stability and specificity of the two constructs are not the causes of their distinctness, what is?

Both constructs arise from appraisals and evaluations; the self is the target in the case of CSE, and the self in regards to the environment is the target in the case of PsyCap. Although evaluations of the self may paint our appraisals of the environment (Packer, 1985, 1985/1986), the current studies suggest that appraisals of the self and the self in regards to the environment are not one in the same. We suggest that this inherent difference between CSE and PsyCap is the cause of their distinctness. Identifying differing targets of evaluations as the primary source of distinction may help better understand prior findings for CSE and PsyCap, and this difference between the two construct should be used as a lens to understand their differing relationships. For instance, authors have argued that PsyCap may be particularly influenced by leadership, while CSE is believed to be more resilient to external sources (Avey, 2014; Gooty, Gavin, Johnson, Frazier, & Snow, 2009; Nübold, Muck, & Maier, 2013). The state-like nature of PsyCap is often believed to be the cause of its susceptibility to leadership, whereas the trait-like nature of CSE is believed to be the cause of its resilience to external sources (Peterson & Zhang, 2011); however, the differing influences on the two constructs may be due to a deeper intrinsic difference. Evaluations of the self may be influenced by external sources, but evaluations of the self in regards to the environment have a more direct link with external sources. Identifying other instances in which this central attribute of CSE and PsyCap, their differing targets of evaluations, is the source of their theoretical and observed differences may help develop a more complete understanding of CSE and PsyCap.

Beyond CSE and PsyCap, we provided initial support for the existence of Negative CSE and Negative PsyCap. While we provided a definition and initial inclusion criteria for these two novel multidimensional constructs, we did not suggest any first-order constructs that may represent Negative CSE and Negative PsyCap. Prior research has shown that the conceptual opposite of many CSE and PsyCap dimensions is not simply the absence of the construct. We believe that a good start for identifying the representative first-order constructs of Negative CSE and Negative PsyCap may be to identify the conceptual opposite of the first-order constructs of CSE and PsyCap. For some of these, the

conceptual opposite is clear. For instance, pessimism is the conceptual opposite of optimism, and these constructs are more than opposite ends of the same spectrum (Beck, Weissman, Lester, & Trexler, 1974; Chang, 2001; Keltner, Ellsworth, & Edwards, 1993). In other cases, the distinction is less clear. Extant research has yet to clearly identify the conceptual opposite of resilience, for example. Thus, in some cases, new first-order constructs may need to be identified to develop the multidimensional constructs of Negative CSE and Negative PsyCap.

Additionally, these results pose concerns for existing measurement of CSE. A serious concern for any measure is construct contamination. The current studies showed that the most popular measure for CSE may partially gauge Negative CSE, possibly causing prior inferences about the construct to be misleading. Also, these results pose less severe concerns for existing measurement of PsyCap. The most popular measure of PsyCap, the PCQ (Luthans et al., 2007a, 2007b), only includes three negatively-worded items, but it would still be beneficial to reword these three items to be positively-worded and ensure that they gauge PsyCap.

Lastly, recent research has shown great interest in using rigorous methods to explore the validity of multidimensional constructs (Johnson et al., 2011a; Johnson et al., 2011b; Johnson et al., 2012). The majority of these methods involve controlling for common method variance among first-order constructs to determine whether a common theoretically-supported link still exists for identifying the multidimensional construct. In the current article, we used a novel method for exploring the validity of multidimensional constructs. We studied whether two closely-related constructs were still empirically distinct despite the presence of any common-method variance, which places a greater focus on the multidimensional constructs rather than the first-order construct. In doing so, we provided a robust test of the two constructs' validity. We suggest that future authors should perform similar tests with other closely-related constructs to ensure that their common theoretical link between first-order constructs is not one in the same – a suggestion for future research that should be considered alongside several others.

7.2. Future research

While distinct, further research should test the extent that CSE and PsyCap are distinct, such as through simultaneously analyzing their nomological nets. Similarly, future research should consider the benefits of studying one construct independent of the other – if any. The two constructs may be so similar that their relationships are almost entirely identical. Likewise, it is possible that the effects of one may be solely through the other. If true, it is most likely that the trait-like construct of CSE has an indirect effect on outcomes through the state-like construct of PsyCap. By studying such relationships, a better understanding can be obtained of the mechanisms that cause CSE to influence outcomes as well as the antecedents of PsyCap – a call for research made by several others (Avey, 2014; Avey et al., 2010a, 2010b; Luthans et al., 2015).

Future research should also investigate the measurement of CSE and PsyCapParticularly, a need is evident for a new scale of CSE that does not include items that may inadvertently gauge Negative CSE. This is not to say that the scale should not have negatively-worded items at all, but rather the negatively-worded items should gauge the absence of first-order CSE constructs (rather than Negative CSE). To create such a scale, it would likely be worthwhile to simultaneously create a Negative CSE scale in order to test the scales' discriminant validity during the scale creation process. Similarly, the most popular PsyCap scale, the PCQ (Luthans et al., 2007a, 2007b), may need to be revised to remove its three negatively-worded items, but it is *not* likely that an entirely new scale is needed to gauge PsyCap.

Additionally, the current article initially supported the existence of Negative CSE and Negative PsyCap. Future research should investigate the measurement of the two constructs and empirically study the differences between CSE and Negative CSE as well as PsyCap and Negative PsyCap. As the constructs are not simply difference ends of the same spectrum, differing theoretical mechanisms should explain the dynamics of the constructs. Perhaps using the approach/avoidance framework as a lens for empirical study, and initial understanding could be obtained in regard to how the sets of constructs affect outcomes differently.

7.3. Limitations

Although the current article has several strengths, some limitations should be noted. First, all data was self-report and cross-sectional, but we explicitly made this methodological decision. Virtually all prior research has gauged CSE and PsyCap through self-report (Ferris et al., 2012; Newman et al., 2014), and studying the properties of the two constructs through any other method may not generalize to most previous or future studies on the constructs. Further, our goal was to provide a conservative test of the distinctness between CSE and PsyCap, which could be achieved through a cross-sectional design. Thus, while self-report and cross-sectional designs are often a limitation, it was necessary for the current article.

Second, we did not control for common method bias, as the current studies were meant to be conservative tests of CSE and PsyCap as distinct constructs. For this reason, the observed relationships between CSE and PsyCap should be seen as an "upper-bound." The factor correlations (0.91, 0.90, 0.94), however, were not drastically different from the findings of prior studies (Avey et al., 2010a, 2010b; Luthans et al., 2007a, 2007b).

Third, the negatively-worded item latent factor for the PsyCap questions was only represented by three items. While a limitation, we believe that these results are even more noteworthy, as the solution with two negative factors was the best fit even with one factor being represented with only three items. If more negatively-worded items were included, the improvement in model fit may have been even greater when modeling both negative factors.

Fourth, in testing the models, cutoffs for the respective fit indices were generally not approached until the fourth model. Even then, the model fit was not entirely satisfactory. This was surprising, given that the CSE and PsyCap scales have been shown to independently produce good-fitting factor structures (Judge et al., 2003; Luthans et al., 2007a, 2007b). The source of the lackluster model fit indices may be from unmodeled variance in either scale. Using the fourth model in Study 1, 26 pairs of items had error variances with modification indices above 10. Eight pairs were from the CSE scale alone, nine pairs were from the PsyCap scale alone, and eight pairs included items from both scales. The largest modification indices were between positively-worded items of the PsyCap scale. While this does pose some concern for the application of the two scales, it does not greatly alter the interpretation of our results. In fact, it may further support our results. Four distinct factors emerged from two scales with closely related items, and these four factors may be even more distinct when using scales with more distinct items. These results do, however, highlight the importance of specifically creating scales for CSE and PsyCap that consist of items that are discriminant from the other multidimensional construct.

8. Conclusion

The current article showed that CSE and PsyCap are two distinct constructs, and their differences are due to more than their differing temporal stability and specificity. We suggest that their distinctness may arise from the differing targets of evaluations – the self in the case of CSE and the environment in the case of PsyCap. We also provided evidence for the existence of Negative CSE and Negative PsyCap – an avenue for future research that may be fruitful.

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