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Positive Projections and Health: An Initial Validation of the Implicit Psychological Capital Health Measure

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Abstract

In this set of studies, we conduct an initial validation of the Implicit Psychological Capital Questionnaire-Health (IPCQ-H), a short, easy to administer and score measure of psychological capital designed to reflect implicit schemas or cognitions surrounding one's health. The results of two studies demonstrate that the implicit measure of IPCQ-H is correlated with an explicit PsyCap-Health measure (PCQ-H), but has very little construct overlap with measures of personality. Moreover, scores of the IPCQ-H were stable over time. Study 2 documents the predictive validity of the IPCQ-H with a number of physical and mental health outcomes. Implications for theory and practice are discussed.

Introduction

Prior research has documented robust relationships between psychological capital (PsyCap) and a number of important outcomes ranging from work behaviors to health and well-being outcomes (e.g. Avey, Reichard, Luthans, & Mhatre, 2011; Luthans, Youssef, Sweetman, & Harms, 2013; Newman, Ucbasaran, Zhu, & Hirst, 2014). However, recent research has attempted to show that domain-specific (e.g. health, relationship, work) measures of PsyCap can be more predictive of outcomes relevant to their domain than generalized measures of PsyCap (Luthans et al., 2013). Moreover, a recent review of the PsyCap literature has argued that there are a number of potential problems with the psychometric properties of the predominantly used explicit self-report measure of PsyCap and suggested that efforts should be made to improve the measurement of this construct (Dawkins, Martin, Scott, & Sanderson, 2013). Beyond simply modifying the existing measures, Harms and Luthans (2012) have suggested that one potential avenue for future measurement work is to attempt to assess implicit PsyCap using projective techniques based on the Thematic Apperception Test (TAT) approach. Based on this, the current paper presents the preliminary validation of the Implicit Psychological Capital Questionnaire-Health (IPCQ-H), a short, easy-to-administer, implicit test of PsyCap in the health-related contexts.

Psychological Capital

PsyCap emerged out of the theory centered on the nascent positive organizational behavior around a decade ago (Luthans, 2002; Wright, 2003). PsyCap itself refers to a positive appraisal of one's own capacity or ability to overcome obstacles with sustained effort and perseverance. This appraisal is usually made through self-assessments of one's current standing on four dimensions of character: hope, efficacy, resilience, and optimism (Luthans, Youssef, & Avolio, 2007b). Hope is defined as the belief that one can accomplish one's goals. Efficacy refers to the general belief that one has the abilities necessary to successfully execute tasks. Resilience refers to the tendency to engage in active, positive coping and the capacity to adapt in the face of obstacles. Optimism refers to making positive attributions about events and the tendency to have positive expectations for future events. Although

other potential constructs (e.g. wisdom or courage) have been proposed as aspects of character that may enhance one's psychological capacity to deal with problems, nearly all PsyCap literature focuses exclusively on these four primary dimensions. Moreover, it has been argued that these four dimensions form a higher-order factor called PsyCap which reflects a general tendency to be able to effectively deal with and overcome obstacles in one's life (Luthans et al., 2007b).

Two recent reviews (Dawkins et al., 2013; Newman et al., 2014) and a meta-analysis (Avey et al., 2011) have documented the robust relationship between PsyCap and a number of organizational outcomes including a wide variety of job attitudes (e.g. job satisfaction and organizational commitment) and aspects of job performance (e.g. task performance and organizational citizenship behaviors). Other studies have shown relationships between PsyCap and behaviors outside the workplace such as job search behaviors (Avey, Luthans, & Jensen, 2009; Chen & Lim, 2012). More recently, however, Luthans et al. (2013) have suggested that PsyCap should be utilized as a contextualized measure. That is, domain-specific versions of PsyCap should be used to predict relevant outcomes in a given context.

Domain-Specific PsyCap

Individuals standing on psychological constructs often varies across domains (e.g. academic, social, work; see Wood & Roberts, 2006). That is, although individuals tend to possess an overall sense of self, they also accurately reflect how their identity and behavior can change across social contexts or social roles (Wood & Roberts, 2006). For example, individuals can readily distinguish the ways in which they may behave differently in work or romantic settings. With regard to PsyCap and closely-related constructs, there is evidence that individuals who demonstrate resilience (e.g. Masten et al., 2004) or efficacy (e.g. Lent, Brown, & Gore, 1997) in one domain of life may not demonstrate it in others.

In addition, contextualized measures tend to be more predictive of outcomes within the domain they are targeted at than generalized measures of the same characteristic (Bowling & Burns, 2012; Lent et al., 1997; Woo, Jin, & LeBreton, 2015; Wood & Roberts, 2006). According to the Personality and Role Identity Structural Model (Wood & Roberts, 2006), this is because role-identities are informed by the

behaviors exhibited and, in particular, the successes and failures experienced in a given domain. Conversely, Wood and Roberts (2006) have also argued that behaviors within specific contexts tend to be influenced to a larger degree by contextualized, rather than generalized, identities.

Following this logic, Luthans et al. (2013) proposed that PsyCap could be separated into three primary domains of life: work, relationships, and health. Further, that domain-specific PsyCap measures would predict domain-specific outcomes better than a generalized PsyCap measure (Luthans et al., 2013; Youssef-Morgan & Luthans, 2015). However, evidence of these hypotheses has been very limited to date. Thus, although work-related PsyCap has already been shown to be positively related to increased health and well-being (Avey et al., 2009; Avey, Luthans, Smith, & Palmer, 2010; Culbertson, Fullagar, & Mills, 2010; Krasikova, Lester, & Harms, 2015; Roche, Haar, & Luthans, 2014), there is a need for the validation of measures of PsyCap that are specific to the health domain.

PsyCap in the Health Domain

Although PsyCap research has generally focused on the work domain, it is becoming increasingly clear that health outcomes are important for successful functioning both inside and outside the work environment. In particular, both individuals and society at large pay particular attention to potential threats to health (e.g. addiction, cancer, diabetes). These health-related stressors can produce considerable strain and negatively impact psychological well-being (Holmes & Rabe, 1967). Thus, PsyCap, or the capacity to persevere through and overcome stressors, may be particularly important in the health context.

PsyCap in the health domain (PsyCap-H) does not differ conceptually from PsyCap in other domains or as a global construct (PsyCap-G). However, it provides greater emphasis on health-related phenomena in providing a frame of reference for evaluating individuals capacity to persevere through and overcome adversity. For example, PsyCap-H may influence the way in which individuals appraise past and future health-related events such that individuals are likelier to perceive a greater chance of remaining or returning to good health given sustained effort (e.g. Karademas, 2006). This means that individuals

higher on PsyCap-H are expected to be more likely to engage in opportunities to sustain and improve health and more likely to persist in efforts to achieve health-related goals (Luthans, Avey, Avolio, & Peterson, 2010; Luthans et al., 2013). These individuals are expected to be more likely to disengage from unhealthy behaviors or ineffective strategies for coping with health decrements and refocus their energies without seeing failure or setbacks as a threat to their identity (Luthans et al., 2013). Finally, positive health experiences, such as fighting through illness or disability, and positive health behaviors, are likely to foster a virtuous cycle of positive development whereby individuals come to see themselves as more capable of taking on greater challenges with each success (Lent, Brown, & Hackett, 1994; Li, Fay, Frese, Harms, & Gao, 2014; Luthans et al., 2007b).

The Measurement of Psychological Capital

To date, nearly all research on PsyCap has been conducted using self-report measures. This is potentially a problem as it is widely known that self-reports are susceptible to socially desirable responding or faking (Roberts, Harms, Smith, Wood, & Webb, 2006). Two recent reviews have noted that much of the research on PsyCap involves self-reports of both PsyCap and its outcomes (Dawkins et al., 2013; Newman et al., 2014). Consequently, there are concerns about the degree to which reported relationships are inflated by common method bias (Doty & Glick, 1998). Moreover, both reviews note that actual psychometric work establishing the validity of the self-report measures of PsyCap is quite limited and argue that additional work is needed moving forward (Dawkins et al., 2013; Newman et al., 2014). In particular, the establishment of viable alternatives to self-report measures is suggested as an important avenue for future research.

In fact, there have been at least two efforts made to establish alternatives to the self-report approach to PsyCap. One of these approaches involves the indirect assessment of PsyCap via a computer-aided text analysis program (McKenny, Short, & Payne, 2010). This approach has the advantage of providing researchers with the capability of assessing PsyCap at a distance using speech or writing samples. Unfortunately, although this approach is relatively straightforward, it can be time-consuming to collect and transcribe sufficient samples for analysis.

Another approach has been the introduction of projective techniques to the study of PsyCap. In order to answer recent calls in the organizational literature for more use of implicit measures in organizational research (see Becker, Cropanzano, & Sanfey, 2011; Harms & Spain, 2014; Latham, Stajkovic, & Locke, 2010), Harms and Luthans (2012) introduced the Implicit PsyCap Questionnaire (IPCQ), a brief projective measure of positive schemas targeted at the work domain based on the TAT approach to assessing implicit cognitions. In this, respondents were presented with three prompts and asked to generate stories in their minds and then respond to a series of questions about the stories they had generated. These questions consisted of filler questions as well as four questions designed to elicit cognitions relevant to the four primary domains of PsyCap. That is, it was argued that individuals with more positive mindsets or schemas would generate more positive stories and scenarios irrespective of whether or not the prompt was positive, neutral, or negative. Moreover, because the prompt instructed the respondent to create a story for an individual other than themselves, respondents would be less likely to engage in socially desirable responding since creating characters with positive attributes would not directly imply that they themselves possessed those positive attributes. Harms and Luthans (2012) initial findings suggested that this approach was predictive of job satisfaction, job performance, citizenship behaviors, and workplace deviance. Moreover, subsequent work (Krasikova, Harms, & Luthans, 2012) demonstrated that not only was this approach predictive of job attitude and job performance outcomes, but also that it was resistant to attempts to make oneself look better. Specifically, the IPCQ remained predictive of outcomes when individuals were asked to pretend that they were applying for jobs whereas the traditional explicit measure of PsyCap ceased to be predictive of many outcomes under the same conditions.

The Implicit Psychological Capital Questionnaire-Health (IPCQ-H)

Based on the prior literature suggesting both a need for a contextualized measure of PsyCap for the health domain and the recent research demonstrating that projective techniques can be used for the assessment of PsyCap, we developed a new measure of PsyCap, the IPCQ-H. Like the IPCQ (Harms & Luthans, 2012), this measure was intended

to be short, able to be scored objectively, and accessible to both literate and non-literate populations. Moreover, it would have sufficient psychometric qualities that would make it interpretable and useful for both research and practice. It has been argued that explicit and implicit measures of psychological constructs assess largely independent aspects of social cognition (Bing, LeBreton, Davison, Migetz, & James, 2007; McClelland, Koestner, & Weinberger, 1989). Specifically, explicit measures can be thought of as assessing conscious and controlled thoughts that an individual has about him/herself in terms of his/ her identity, values, motivations, and behaviors. Implicit measures, on the other hand, are thought to assess unconscious and automatic thoughts about these same aspects of character (Bing et al., 2007; Greenwald & Banaji, 1995; Lilienfeld, Wood, & Garb, 2000). Although both tend to influence behavior to some degree, it has been argued that explicit measures tend to be more predictive of short-term outcomes and situations where individuals have a great deal of control or opportunity for deliberation while implicit measures are more predictive of long-term outcomes or situations where impulsive decisions and behaviors are necessary (McClelland et al., 1989).

As noted above, this dichotomy oversimplifies the reality that both implicit and explicit cognitions not only influence outcomes, but can also influence one another (Thrash, Cassidy, Maruskin, & Elliot, 2010). For example, to the degree that implicit measures require deliberative action such as reading or responding to written prompts, it is likely that the explicit cognitions will influence responses. Likewise, explicit self-reports are a product of implicit schemas, conscious agendas, situational demands, and prior experiences (Hogan & Nicholson, 1988). Consequently, no psychological measure is purely implicit or explicit, but rather assesses those constructs to various degrees.

That said, although it can be argued that implicit and explicit cognitions may influence one another, in practice implicit cognitions are more likely to exert influence on explicit cognitions than the other way around. One reason for this is that although behaviors can be influenced by both implicit and explicit processes (McClelland et al., 1989), only explicit identity claims about one's own personality are frequently updated based on conscious recognition and reflection of one's own actions (Thrash et al., 2010; Wood & Roberts, 2006). Put another way, we observe what we actually or typically do in terms of behavior and this informs our explicit identity which, in turn, is

reflected in self-report measures (Hogan & Nicholson, 1998). Thus, outcomes of implicit processes (i.e. patterns of behaviors) can result in very real changes in explicit cognitions. Or, as Murray (1938) argued, “one of the steps in the development of personality is that of becoming conscious of what is unconscious” (p. 144). On the other hand, implicit cognitions reflect unconscious impulses and drives that are not readily changed (Gawronski, LeBel, & Peters, 2007; McClelland, 1985; McClelland et al., 1989). This is not only because they are believed to be rooted in biological or evolutionary impulses, but also because implicit cognitions develop from a long history of associations between actions and the resulting rewards or punishments (Murray, 1938; Winter, 1996). One can draw a parallel with operant conditioning where once an association is made, it is highly resistant to extinction or change (Baeyens, Eelen, Van den Bergh, & Crombez, 1989; Kirsch, Lynn, Vigorito, & Miller, 2004). Moreover, as noted above, scores on implicit measures tend to be influenced by explicit cognitions only to the degree that the measurement requires explicit cognitions in order to produce responses. Consequently, some operationalizations of implicit cognitions can produce effects suggesting that explicit processes impact implicit processes even when no such change has actually occurred.¹

In the present study, we take this asymmetry of effects between implicit and explicit cognitions into account and argue that the effects of implicit PsyCap on health outcomes will be mediated through their effects on explicit PsyCap. That is, unconscious processes, particularly those involved in perceiving situations as being more positive, will shape conscious beliefs about the self in terms of the capacity to overcome obstacles and recover from setbacks and this will result in more positive health outcomes and behaviors.

In the past, implicit measures have been criticized for a number of reasons including the complexity of scoring systems, relative unreliability, the lack of convergence with explicit measures, concerns about whether the construct of interest is really being measured, the

1. That implicit cognitions should be drivers of explicit cognitions is also consistent with recent functionalist accounts of personality where motives, efficacies, and perceptions are argued to be antecedents of behavioral patterns, self-schemas, and social attitudes (e.g. Fleeson & Jayawickreme, 2015; Fleeson & Jolley, 2006; Harms, Wood, & Spain, 2016; Wood, Gardner, & Harms, 2015).

difficulty of conducting assessments in the workplace, and the potential susceptibility to response distortions (LeBel & Paunonen, 2011; Schultheiss, 2008). Despite these criticisms, there is a growing interest in such measures in the organizational research community (see Bowling & Johnson, 2013; Kehr, 2004) because there is accumulating evidence that such measures are linked to outcomes such as leadership, conflict escalation and resolution, creativity, health, and aggression (James & LeBreton, 2010; Lilienfeld et al., 2000; Schultheiss, 2008). For example, recent research using word-fragment completion tasks to assess implicit self-concepts demonstrated the predictive power of the implicit constructs for a variety of work performance outcomes above and beyond that of explicit measures (Johnson & Saboe, 2011). Moreover, some implicit constructs have been shown to interact with self-reported traits such that behavioral expressions of the implicit construct differ depending on the level of its explicit counterpart (e.g. Frost, Ko, & James, 2007; James & Mazerolle, 2002; Winter, John, Stewart, Klohn, & Duncan, 1998). Based on these and other studies, it has been suggested that both implicit and explicit techniques should be utilized in order to enhance personality assessment in organizational settings (Bing et al., 2007).

The IPCQ-H represents a continuation of this line of reasoning in that it is intended to assess individuals' implicit schemas surrounding their ability to produce positive health behaviors and their internalized norms about how likely positive health behaviors are to occur. Prior research has related PsyCap to general health and well-being (Avey et al., 2010; Culbertson et al., 2010), but an implicit measure of PsyCap reflects a more general sense of positivity or positive schemas even as it reflects the four primary dimensions of PsyCap. Prior research has established that possessing a positive orientation can be predictive of both job performance and organizational citizenship behaviors (Alessandri et al., 2012; Judge, Erez, & Bono, 1998). More specifically, that positive affect is related to successful outcomes in work, relationships, and even health (Lyubomirsky, King, & Diener, 2005; Ong, 2010). However, none of this research directly taps implicit mindsets or schemas.

Some research, however, has suggested that implicit positivity is associated with positive health and well-being outcomes in the workplace. For example, measures of broad positivity towards neutral objects and situations have been shown to positively relate to both life

and job satisfaction (Eschleman, Bowling, & Judge, 2015). Moreover, assessments of positive mindset using person-perception approaches have shown that having a positive mindset is associated with higher levels of organizational satisfaction, less cynicism, greater identification with their organization, and more positive peer ratings of personality and popularity (Wood, Harms, & Vazire, 2010). That said, neither of these approaches is or can be targeted at the health domain specifically. Moreover, the methods used by Wood et al. (2010) are likely prohibitive for researchers since they necessitate collecting multiple random peer ratings from each individual in order to distinguish between target and rater effects.

Instead, we propose an alternative method that we believe is particularly well suited to assessing and reproducing the theoretical four-factor structure that is manifest in existing explicit measures of PsyCap. As noted above, this approach is based on prior research investigating the assessment of implicit PsyCap in the work domain (Harms & Luthans, 2012; Krasikova et al., 2012). Specifically, we propose that implicit schemas of psychological capital can be assessed using a series of story prompts with a standardized set of responses. Essentially, this format is derived from the widely used Thematic Apperception Test (TAT) approach. This approach to assessing implicit cognitions is well established in both the basic and applied literature (see LeBel & Pajunen, 2011; Uhlmann et al., 2012). Traditionally, this approach has involved providing participants with a series of pictures and then asking them to generate written stories about each of the pictures. Expert raters are then used to score the content of the stories for particular themes. The basic idea is that if an implicit schema is sufficiently important to the individual, it will reveal itself by repeatedly manifesting itself in the content of the stories. For example, an individual with high levels of implicit power motivation will repeatedly produce stories that involve individuals attaining or losing or contesting formal or informal status and influence. The difference between the current instrument and most prior TAT assessments is that it uses a fixed response set that allows researchers to ensure that the constructs of interest are considered and rated by the participant. This also allows for easier and more objective scoring since there is no need for raters to code content. This approach to scoring TAT-type tests has been used in prior research and has demonstrated similar predictive properties to traditional TATs (e.g. Schultheiss, Yankova, Dirlikov, & Schad, 2009;

Sokolowski, Schmalt, Langens, & Puca, 2000). In the present study, we use prior theory surrounding PsyCap to create response questions that are as close as possible to definitions of the four PsyCap dimensions in order to ensure that such story content is captured.

The present approach also differs from traditional and recently developed alternatives to the TAT in that it uses sentence prompts rather than pictures. This is to avoid potential race, gender, age, or other situational content that may influence stories. Moreover, the prompts used do not specifically tell the participant who the person in the story is. Rather, participants are instructed to create a story about “someone.” This person is not necessarily themselves. The prompts are designed this way so as to avoid efforts to self-protect egos by generating positive stories or likeable characters. Since the story generated is about an ambiguous “other”, it is believed that participants will be more willing to allow their implicit schemas to manifest without ego-defense mechanisms or conscious efforts to engage in socially desirable responding to interfere with honest reporting. Finally, in order to enhance the ability of the measure to detect a wider range of implicit schemas, the prompts are written to reflect three levels of situational difficulty. That is, an individual is more likely to have abnormally low levels of implicit positivity if they cannot see the good in even positive situations. Likewise, they are more likely to be incorrigibly positive-minded if they report highly positive schemas for even aversive situations.

One further advantage of the scale development procedures used for the ICPQ-H is that it can be used to create measures that align with multidimensional theoretical models. That is, by choosing items that fit the core definition of each factor in the model, one can differentiate between different aspects of the overall factor. If it is true that implicit personality characteristics are precursors of explicit personality characteristics, then it should be expected that the structural patterns of one will closely match the other. This proposition has rarely been tested, but recent work on the subfacets of the trait Conscientiousness have shown remarkable consistency in the structural patterns across implicit and explicit measures ($r = .82$; Constantini et al., 2015). Similarly, research has demonstrated that implicit measures of PsyCap targeted at the work domain demonstrate the same four-factor structure found in explicit PsyCap measures (Krasikova et al., 2012). Consequently, we anticipate that the theoretical four-factor model of

PsyCap will be replicated in the present study of implicit PsyCap in the health domain. On the whole then, we believe that this approach offers numerous advantages to other alternative methods in that it avoids concerns with target effects, does not require large groups of individuals who know one another, and reduces the time needed to assess the implicit mindset of the individual. At a broader level, we believe that this approach represents a method for creating implicit measures that avoid some of the problems associated with other implicit measurement approaches (e.g. ease of scoring, reliability; see LeBel & Paunonen, 2011).

In the present study, we aim to demonstrate that this new measure of implicit PsyCap in the health domain (1) appropriately reflects the four-dimensional theoretical model of PsyCap, (2) shows convergent validity with existing explicit measures of PsyCap-H, (3) demonstrates little construct overlap with widely used measures such as the Big Five personality traits, (4) is predictive of health indicators, and (5) has its effects partially mediated through explicit PsyCap-H.

Method

Participants and Procedures

Two samples were used in this study. Sample 1 consisted of 161 university students participating for extra credit in an introductory Management course. The average age was 21.96 years and 66 per cent of the sample was male. Participants in Sample 1 completed measures of explicit and implicit psychological capital along with a brief measure of personality. Two weeks later they were asked to complete both measures of psychological capital a second time. Of the initial sample, 136 participants completed the measures a second time. Sample 2 consisted of 356 employed adults from a variety of jobs and industries. The average age of these participants was 38.79 years and 44 per cent of the sample was male. All of these individuals reported having regular jobs and 81.1 per cent reported working more than 40 hours per week. These individuals completed both explicit and implicit measures of psychological capital along with a set of questions concerning their health behaviors and experiences.

Measures

Explicit PsyCap (PCQ). Psychological capital was assessed using the 12-item self-report measure PCQ-12 (Luthans et al., 2007b). Questions were answered using a 6-point scale (1 = *strongly disagree*; 6 = *strongly agree*). For both studies, assessments of PsyCap-Health (PCQ-H) were assessed by changing the standard items to reflect health. For example, the item “I always look on the bright side of things regarding my *job*” becomes “I always look on the bright side of things regarding my *health*.” When assessing PsyCap in general, items were altered to reflect the participants *life overall*.

Implicit PsyCap Questionnaire-Health (IPCQ-H). The current implicit measure has been modified from an existing measure of implicit psychological capital to focus on positivity in the health context. In order to determine whether or not individuals possessed an implicit positive mindset we presented participants with three prompts and then asked them to generate stories in their minds for a few minutes. Participants were then asked to answer four questions about the stories they generated (see **Table 1** for instructions, the three story prompts, and the same four questions asked about each story). As shown, one prompt presented a positive cue with regard to health (i.e. “Someone is exercising”), one prompt presented a negative cue (i.e. “Someone is sick”), and one prompt provided an ambiguous cue (i.e. “Someone goes to the hospital”) open to interpretation by the story author. Participants were not asked to actually write their stories, just to imagine them. For each of the prompts, participants were asked to indicate the extent to which the character in their story was “feeling confident and self-assured in their ability” (efficacy), “believing that they can accomplish their goal” (hope), “believing that they can bounce back from any setbacks that have occurred” (resilience), and “expecting good things to happen in the future” (optimism). They were also asked to report on several other potential themes using filler items in order to disguise the intent of the measure. For example, “feeling accepted by others” and “being concerned about being seen as important”. All items were answered using a 7-point scale (with anchors of 23 5 *the opposite is very true of this character*; 0 5 *irrelevant thought/feeling for this character*; 13 5 *very true of this character*). The responses were

Table 1. Implicit Psychological Capital Questionnaire-Health (IPCQ-H)

Instructions	<i>Your task is to invent stories about the people in the statements below. Try to imagine what is going on. Think about what happened before, who the characters are, what they are thinking and feeling, what will happen next, and how the story will end. You don't need to write the story down, just think about it until it is clear in your mind. Then respond to the following questions using your own thoughts about what the character is thinking and feeling. Plan to spend around 2–4 minutes per story. There are no right or wrong stories. Imagine whatever kind of story you like.</i>
Story prompts	<ol style="list-style-type: none"> 1. Someone is exercising 2. Someone goes to the hospital 3. Someone is sick
Questions	<ol style="list-style-type: none"> 1. Feeling confident and self-assured in their ability 2. Believing that they can accomplish their goal 3. Believing that they can bounce back from any setbacks that have occurred 4. Expecting good things to happen in the future
Response scale	Rate the degree to which the character in your story thinks or feels this using the following scale: +3 Very true of this character +2 Somewhat true of this character +1 Slightly true of this character 0 Irrelevant thought/feeling for this character -1 The opposite is slightly true of this character -2 The opposite is somewhat true of this character -3 The opposite is very true of this character

combined into an overall score using the framework described in Harms and Luthans (2012). That is, they were combined into PsyCap subscales using mean levels of endorsement and then were further averaged across the four subscales into an overall PsyCap-health score. In both samples, we assessed the fit of the IPCQ-H using a four-factor model with a higher-order factor and correlations between residuals within prompts to account for method variance. In both samples the fit for the established theoretical model was good (Sample 1: $\chi^2_{(32)} = 53.76$, $p < .05$, CFI = .95, RMSEA = .07 (90% CI [.03, .10]), SRMR = .06; Sample 2: $\chi^2_{(32)} = 67.37$, $p < .05$, CFI = .98, RMSEA = .06 (90% CI [.04, .07]), SRMR = .03).

Big Five Personality Dimensions. In the student sample, Big Five personality traits were assessed using the four-item Mini-IPIP scales (International Personality Item Pool; Donnellan, Oswald, Baird, & Lucas, 2006) on a 7-point scale (23 5 *strongly disagree*; 13 5 *strongly agree*). These scales assess Extraversion, Emotional Stability, Agreeableness, Conscientiousness, and Intellect. Alpha reliability coefficients ranged from .68 to .85.

Health. Health was assessed using a variety of indicators of positive and negative health outcomes and behaviors.

Body Mass Index: BMI was calculated using height and weight information provided by participants. Higher BMI scores are indicative of being more overweight.

Exercise: Exercise was assessed using a single item asking the participants how many hours they typically spent exercising per week.

Short Form Health Survey-12 (SF-12): To assess a broad range of physical and mental experiences and/or outcomes, we used the 12-item version of the Short Form (SF)236 Health Survey. This was scored into eight dimensions using the framework provided by Ware, Kosinski, Turner-Bowler, and Gandek (2002). The resulting subscales consisted of: Physical Functioning (the degree to which one's health limits moderate physical activity), Role Physical (the degree to which physical problems have kept one from achieving goals), Bodily Pain (the degree to which pain interferes with one's work), General Health (an overall assessment of health), Vitality (the degree to which someone feels full of energy), Social Functioning (how often physical health problems inhibit social activities), Role Emotional (the degree to which emotional problems have kept one from achieving goals), and Mental Health (the degree to which an individual reports experiencing mental distress). All measures were scored so that higher scores indicate more positive health. Each dimension used unique ratings scales.

Gender. Participants were asked to indicate whether they were male (1) or female (2).

Age. Participants were asked to indicate how many years old they were at the time of the study.

Results

Means, standard deviations, reliabilities, and intercorrelations of the variables for Sample 1 are presented in **Table 2** and for Sample 2 are presented in **Table 4**. Convergent validity for the implicit measure of PsyCap-Health (IPCQ-H) was established by correlating it with the corresponding explicit measure (PCQ-H). For both the student sample ($r = .31, p < .05$) and the working adults ($r = .37, p < .05$), there was a significant positive relationship between scores generated by the two different techniques. Although this correlation is not large, this effect is best interpreted in light of similar recent meta-analytic findings showing that implicit association tests typically have small-to-medium effect sizes in terms of convergence with explicit measures (Dovidio, Kawakami, & Beach, 2001; Hoffman, Gawronski, Gschwender, Le, & Schmidt, 2005).

In Sample 2, we also assessed the degree to which the IPCQ-H was reflective of health-specific cognitions by correlating it with the explicit PsyCap-General measure (PCQ-G). The IPCQ-H correlated somewhat less strongly ($r = .33, p < .05$) with the PCQ-G than with the domain-specific PCQ-H ($r = .37, p < .05$). Although this difference was non-significant ($p = .21$), this is suggestive that this measure actually reflects health-related schemas and not just a positive mind-set in general.

Table 2. Means, Standard Deviations, Reliabilities, and Intercorrelations among Variables in Sample 1 (Students)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
1 Gender	1.34	0.48	–										
2 Age	21.96	3.93	2.13	–									
3 Extraversion	.52	1.46	.10	2.14	.85								
4 Emotional Stability	.60	1.16	2.17*	2.03	.11	.68							
5 Agreeableness	1.26	1.05	.28*	2.15	.25*	.03	.68						
6 Conscientiousness	1.02	1.17	2.01	.01	2.04	2.05	.17*	.75					
7 Intellect	.97	1.19	.08	2.06	.18*	.16*	.37*	.06	.77				
8 PCQ-H T1	4.49	.76	2.06	.03	.28*	.32*	.14	.20*	.17*	.85			
9 IPCQ-H T1	1.05	.82	.02	2.09	2.02	.10	.07	.14	.14	.31*	.77		
10 PCQ-H T2	4.53	.82	2.10	.14	.24*	.40*	.01	.08	.15	.75*	.35*	.89	
11 IPCQ-H T2	.66	.91	.08	.12	2.00	.11	.06	.10	.03	.24*	.63*	.20*	.85

N ranges between 119 and 161.

Values on the diagonal are internal consistency estimates.

Gender scored M=1 and F=2.

* $p < .05$

Table 3. Construct Overlap between PsyCap-Health Measures and Big Five Personality in Sample 1.

Predictor	PCQ-H β	IPCQ-H β
Gender	2.03	.04
Age	.08	2.09
Extraversion	.29*	2.07
Emotional Stability	.28*	.12
Agreeableness	.03	2.03
Conscientiousness	.15	.08
Intellect	.10	.13
R ²	.23*	.05

N = 140

* $p < .05$

Table 4. Means, Standard Deviations, Reliabilities, and Intercorrelations among Variables in Sample 2 (Working Adults)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Gender	1.56	0.50	—														
2 Age	38.79	13.60	2.03	—													
3 BMI	26.76	5.78	2.26*	.18*	—												
4 Hrs Exer./Wk	7.17	10.75	2.11	.01	.03	—											
5 Phys. Func.	1.75	.47	2.04	2.20*	2.17*	2.02	.66										
6 Role Phys.	1.81	.34	.03	2.02	2.13*	2.04	.39*	.52									
7 No Pain	1.32	.90	.01	2.06	2.14*	.00	.41*	.53*	—								
8 Gen. Health	2.11	.78	.16*	.02	2.26*	.13*	.20*	.20*	.25*	—							
9 Vitality	3.01	1.16	2.05	2.09	2.25*	.09	.29*	.28*	.29*	.32*	—						
10 Soc. Func.	1.33	.89	.04	.12	2.09	2.03	.18*	.31*	.33*	.20*	.14*	—					
11 Role Emot.	1.78	.36	2.04	.03	.01	2.12*	.22*	.42*	.37*	.13*	.24*	.50*	.51				
12 Men. Health	3.33	.93	2.08	.03	.01	.02	.23*	.25*	.28*	.26*	.42*	.44*	.41*	.41			
13 PCQ-G	4.53	.76	2.03	.03	2.15*	2.03	.21*	.24*	.25*	.31*	.30*	.31*	.26*	.46*	.79		
14 PCQ-H	4.43	.86	.13*	.03	2.21*	.02	.13*	.18*	.04	.39*	.23*	.24*	.16*	.27*	.49*	.61	
15 IPCQ-H	1.08	1.00	.01	.19*	.02	.01	.08	.14*	2.00	.14*	.17*	.14*	.14*	.18*	.33*	.37*	.86

N ranges between 262 and 356.

Values on the diagonal are internal consistency estimates.

Gender scored M=1 and F=2.

* $p < .05$

When the IPCQ-H and PCQ-H were assessed again two weeks apart (Sample 1), each of the measures showed substantial consistency across time. The test-retest correlation for the PCQ-H was $r = .75$, $p < .05$. The test-retest correlation for the IPCQ-H was slightly lower ($r = .63$, $p < .05$). Nonetheless, both of these stability coefficients were consistent with those found for other measures of individual differences (Roberts & DelVecchio, 2000; Trzesniewski, Donnellan, & Robins, 2003).

Based on prior recommendations (Antonakis, Ashkanasy, & Dasborough, 2009; Credé, Harms, Nierhorster, & Gaye-Valentine, 2012), we assessed discriminant validity by correlating the IPCQ-H and PCQ-H with a measure of Big Five personality in Sample 1. Big Five personality measures are particularly well suited for such a test as they represent a broad range of personality factors (John & Srivastava, 1999). Moreover, they have been shown to be distinct from explicit PsyCap in prior research (Luthans, Avolio, Avey, & Norman, 2007a). Scores on the explicit measure of PsyCap exhibited significant positive correlations with all of the Big Five personality traits with the exception of Agreeableness. Correlations between PCQ-H and the Big Five scales ranged from .14 to .32. The IPCQ-H was not significantly correlated with any of the Big Five personality traits, with correlations ranging from .02 to .14. Thus, at the zero-order level, there was substantial evidence that the implicit measure was distinct from the widely used Big Five personality dimensions. To further illustrate this point, we used multiple regression to estimate what percentage of variance in each of the PsyCap-Health measures was able to be accounted for by demographic and personality trait variables (see Table 3). As expected, the PCQ-H showed substantial overlap with these variables ($R^2 = .23$), but the IPCQ-H was largely distinct ($R^2 = .05$).

To assess predictive validity, we correlated both of the PsyCap-Health measures with our 10 indicators of physical and mental health (see Table 4). The PCQ-H showed significant correlations with BMI and seven (of eight) SF-12 Health Survey indicators in Sample 2. The IPCQ-H correlated significantly with six (of eight) SF-12 Health Survey indicators, most of which were indicators of mental, as opposed to physical, health. For each indicator of health, the observed relationship between PsyCap and the health indicator was stronger for the explicit measure. This, however, is not entirely unexpected as most of the health indicators are self-reported as well and these relationships

may be inflated because of common method variance. Moreover, the patterns of correlations between the PCQ-H and IPCQ-H were quite similar to one another ($r = .80$). That is, both the explicit and implicit measures of PsyCap-Health related most strongly (and weakly) to the same health indicators.

Beyond simply being correlated with health outcomes, we also proposed that the effects of implicit measures should be mediated through their effects on explicit measures of those constructs. Thus, we expected the significant relationships between the IPCQ-H to be mediated through the explicit PCQ-H. To test this, we used a bias-corrected bootstrap approach with regression analyses (Hayes, 2013), estimating 1,000 bootstrap samples. Bootstrapping reduces the threat of Type I error resulting from violations of the assumption that data are normally distributed (Shrout & Bolger, 2002), a particular concern given our moderate-sized sample. In line with the mediation technique described in Baron and Kenny (1986), scores from the explicit measure of PsyCap (mediator) were regressed on those of the implicit measure (predictor), and scores on health indicators (outcomes) were regressed on scores of both explicit and implicit PsyCap measures. Results are shown in Table 5 for those health indicators that were significantly correlated with the implicit measure at the zero-order level. For five of the six SF-12 Health Survey indicators that were predicted by scores on the IPCQ-H, bootstrapping results showed that the effects of IPCQ-H on the health outcomes were fully mediated. In the case of SF-12 Role Emotion scores, both the direct and indirect effects of IPCQ-H scores were non-significant. These results support our assertion that not only is IPCQ-H predictive of health outcomes, but that its effects are mediated through its effects on explicitly measured PsyCap-Health.

Discussion

The present study aimed to introduce a new implicit measure of PsyCap targeted specifically at assessing a positive mindset with regard to health behaviors. To do so, we utilized a well-established method for assessing implicit cognitions, the TAT, but modified the approach to allow for quick administration and standardized scoring. Although the present results should be considered preliminary, they

were nonetheless promising and suggest that this topic is ripe for future research. Results demonstrated that the new implicit measure of PsyCap in the health domain had sufficient reliability and its structure reflected the theoretical model of PsyCap. Moreover, results indicated significant convergent validity with existing self-report measures of PsyCap while also demonstrating markedly lower levels of overlap with other individual difference measures than were seen in the traditional explicit measure. This suggests that while the core of both of the measures may be similar, the new implicit measure is more independent of common variance with established measures. The new implicit measure of PsyCap correlated with a number of health indicators and, in line with prior theory suggesting that the distal effects of implicit constructs may influence behaviors via their impact on more proximal explicit cognitions, the effects of implicit PsyCap were mediated through explicit PsyCap.

These results are promising, but it should also be emphasized again that they represent preliminary results for the use of a new measure. The correlations coefficients between the implicit measure and the health outcomes were somewhat weak by conventional standards of effect sizes (Cohen, 1992; Paterson, Harms, Steel, & Cred e, 2016). Moreover, the effects of the implicit measure were fully mediated by the explicit measure. That said, it is possible that the explicit PsyCap measure demonstrated a stronger relationship to the health outcomes not only because it is theoretically more proximal, but also because both variables were assessed with explicit self-reports. That is, that the relationship between the two variables may have been inflated because of common method variance (Doty & Glick, 1998). Only studies employing objective health outcomes will ultimately be needed to determine the degree to which each technique uniquely predicts health outcomes. Consequently, we see the need for additional research for the assessment of implicit and explicit PsyCap measures in both the work and health domains.

We also see the need for additional refinement of this technique and this measure. Our broader purpose in this research is to examine the possibility that implicit capacity to appraise health-related situations in a positive light can be assessed in an easy-to-administer format that is also easily scored and easily understood by practitioners. We believe that the current study represents an important step forward in that process. Our prior work with implicit PsyCap focused on

the work domain has demonstrated that it is predictive of job performance above and beyond the effects of both personality and explicit PsyCap in addition to being robust to attempts to fake in order to make oneself look better (Harms & Luthans, 2012; Krasikova et al., 2012). However, the fact that the present study showed less substantial effects could be indicative of a need to refine the measure. Our initial aim was to assess whether or not an individual maintained a capacity to appraise health-related situations in a positive light when conditions were easy to do so, ambiguous, and difficult. But it is possible that the prompts we used to create these conditions were insufficient. For example, the prompt “someone goes to the hospital” is intended to be ambiguous since it is not clear whether they are being admitted, whether they work there, or whether they are visiting someone who is sick. However, it may be that regardless of our intentions the expression “goes to the hospital” triggers in most people’s minds a negative situation. Likewise, it is not necessarily as clear that “someone is exercising” is intended to prompt a positive situation as it is that “someone is sick” is intended to prompt a negative situation. It is also possible that three prompts are simply insufficient to capture the breadth of this construct adequately. Prior research has demonstrated that highly abbreviated self-report measures tend to truncate effect sizes found in research (Credé et al., 2012). The same may be true of short implicit measures. Consequently, it is possible that further item refinement and scale development is needed. For example, beyond simply providing a wider array of context-relevant prompts (e.g. “someone was just injured”), future scales may reduce ambiguity by providing more context (e.g. “someone goes to the hospital *for surgery*”) or intentionally manipulate the perceived negativity/positivity of an item prompt by changing the extremity of the wording (e.g. “someone is *very* sick”; see Haigler & Widiger, 2001).

That said, we remain convinced that there is an opportunity to be had to create projective measures that are both effective at predicting outcomes and easily used for both research and practice. We hope that other researchers will adapt the technique used here to explore whether or not this technique can be effectively used to measure other implicit constructs of interest to organizational scholars such as ethics, leadership, trust, or values. We believe that the current approach has several advantages over both explicit and other implicit approaches. First, it does not require special training in coding practices or the

need for interpretation (e.g. TATs), the use of computers (e.g. IATs), or having participants rate multiple random targets in order to establish perceptual biases (e.g. Wood et al., 2010). Second, because the present technique can be presented orally to participants or job applicants, it does not require the literacy skills necessary for word-fragment completion tasks. Third, because the current measure uses filler items, it is not immediately clear what the objective of the measure is and it is therefore more difficult to fake.² Finally, because the character being described in the prompt is not the participant or job applicant themselves, there is no strong demand effect for socially desirable responding. In fact, a job incumbent may be more likely to believe that the goal of the task is to assess creative thinking. This suggests the possibility of moving this measure or at least this approach to measurement from the research domain into applied settings. Thus, the current project provides avenues to move forward in both research and practice.

Conclusions

The present study presents the initial steps towards validating a new implicit measure of PsyCap in the health domain, the IPCQ-H. Results suggest that the new measure possessed convergent, discriminant, and predictive validity as well as acceptable psychometric properties in terms of structure and reliability. The current study provides some preliminary evidence of the utility of projective techniques in predicting health outcomes, but further research is needed to fully assess whether this approach to assessing implicit constructs is suitable to the occupational health and well-being domain.

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