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HERO in action (crisis): the role of psychological capital in experiencing an action crisis

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Abstract
In some situations, goal striving does not go without problems, leading to intrapsychic decisional conflict between giving up and persisting in problematic goal striving, known as an action crisis. However, only limited attention has been devoted to cultivable positive psychological resources that can shield individuals from an action crisis development. In the six studies, we examined the role of psychological capital (PsyCap), the higher-order construct based on similarities between hope, self-efficacy, resilience, and optimism and their unique characteristics in an action crisis experience. A pilot study ($N=295$) established a link between variables, indicating that the more PsyCap participants had, the fewer action crises they experienced (and vice versa). In a preregistered follow-up study ($N=210$), this finding was replicated. Furthermore, it was shown that the relationship was indirect, potentially mediated by the appraisals of goal attainment. In the third study ($N=411$), some essential aspects were varied. The main findings were conceptually replicated, showing that PsyCap was associated with action crisis and predicted it above and beyond selected personality traits (negative emotionality and conscientiousness). In the fourth and fifth study ($N=272$ and $N=268$), the indirect role of goal-related negative emotions, controlled motivation, and effort was supported. Also, results were partially extended to goal progress. However, in a longitudinal study ($N=254$) with the random intercept cross-lagged panel model, it was shown that although the average level of PsyCap across time points is negatively associated with the average level of action crisis (i.e., the between-person effect was supported), the cross-lagged within-subject effect of PsyCap on action crisis was not supported.

Keywords Action crisis · Goals · Psychological capital · Hope · Optimism · Self-efficacy · Resilience

Introduction

Goals could be conceptualized as 'representations of desired states' (Austin & Vancouver, 1996; p. 338) or, more specifically, as a 'cognitive representation of the desired end state that a person is committed to attain' (Milyavskaya & Werner, 2018; p. 164). Goals represent an important and frequently investigated research topic (Aarts & Elliot, 2012; Austin & Vancouver, 1996; Brandstätter & Hennecke, 2018; Milyavskaya & Werner, 2018; Moskowitz & Halvorson, 2009), as they play an important role in the lives of individuals and society. However, not every case of striving for goals goes without problems. When setbacks accumulate, a decisional conflict known as an action crisis emerges (Brandstätter & Schüler, 2013; Brandstätter et al., 2013; Herrmann & Brandstätter, 2013), hampering goal attainment (Herrmann & Brandstätter, 2015). This can lead to various mental and physical health-related consequences (e.g., Brandstätter et al., 2013; Holding et al., 2017, 2021).

An action crisis is not inherently negative, though. In some cases, it can help individuals disengage from problematic goals (Brandstätter & Herrmann, 2016), as letting go of futile goals can facilitate the well-being of an individual in the long run (Wrosch & Scheier, 2020). However, persistence is not only a default type of self-regulation (Rothermund & Brandtstädter, 2021) but is often also necessary for successful goal attainment as it allows individuals to attain long-term goals such as learning a new language or passing an academic course (Brandstätter & Bernecker, 2022). In fact, as stressed by Herrmann and Brandstätter (2015), the 'significance of the development of effective intervention techniques for the prevention and resolution of action crises

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(e.g., in academia), in the face of the possible consequences of an action crisis, is evident' and also 'promising avenue for future research' (p. 133). However, before interventions can be implemented, it is essential to identify and systematically corroborate potential shielding factors that can be cultivated. Therefore, the present research aims to expand our understanding of psychological capital—a factor that has the potential to shield individuals from the development of an action crisis—and examine how it fits into the broader nomological network of an action crisis.

Imagine two students—John and Peter. John is optimistic, self-efficient, resilient, and hopeful about pursuing his academic goals. Peter is the opposite. Which will encounter a higher degree of action crisis during academic pursuit? Based on the Conservation of Resources Theory (Hobfoll, 2011; Hobfoll et al., 2018) and related theories focused on goal striving, self-regulation, and action phases (e.g., Brandstätter & Bernecker, 2022; Gollwitzer & Keller, 2016; Keller et al., 2019), we suppose that Peter is more likely to experience a crisis due to the (lack of) essential personal resources, commonly referred to as psychological capital. We hypothesize that these resources play a vital role in facilitating his pursuit of goals by reinforcing his belief in control, intentionality, and agency over goal attainment. They enhance the actional phase and its corresponding mindset, ultimately protecting against the onset of an action crisis. In the following sections, we will delve into psychological capital and then explore the action crisis and its potential interplay with psychological capital.

Psychological capital

According to the originators of the construct, Luthans et al. (2006a, b), *Psychological capital* (*PsyCap*) refers to an 'individual's positive psychological state of development' (p. 3). More specifically, PsyCap is conceptualized as a higher-order construct based on four specific psychological resources derived from positive psychology (Luthans & Youssef-Morgan, 2017). These HERO personal strengths—an acronym for the four components of PsyCap, namely hope, self-efficacy, resilience, and optimism—are characterized by: (1) determined striving towards objectives and, when necessary, generating strategies and adjusting pathways to these objectives (*hope*), (2) having generalized positive attribution concerning present and future (*optimism*), (3) demonstrating a sense of self-assurance in undertaking and investing the requisite effort to achieve success (*self-efficacy*) and (4) confronting challenges and adversities with the capacity to endure and rebound *(resilience*).

Although PsyCap is based on well-established constructs, some distinguishable features can be identified (for further discussion, see Luthans & Youssef-Morgan, 2017). First, PsyCap is more domain-specific. While PsyCap was originally developed in the organizational context as a tool that extends various forms of capital—social, human, and traditional (e.g., technology and financial) resources (Luthans & Youssef, 2004), more recent studies have applied it to other contexts, including academic adjustment/ performance of undergraduates (Vanno et al., 2014) and high-school students (Carmona-Halty et al., 2019; see also Dudasova et al., 2021b for a review). Relatedly, Luthans and colleagues suggested that PsyCap is more state-oriented on a trait-to-state continuum. As such, PsyCap could be relatively easily cultivated by interventions and training programs (Lupșa et al., 2020; Salanova & Ortega-Maldonado, 2019), bolstering its practical value. In fact, a recent meta-analysis of 41 controlled studies by Lupșa et al. (2020) supported a modest but significant effect of interventions on overall PsyCap ($d = 0.26$) and its components ($d = 0.22$ to 0.49). Third, as the four components are interconnected and synergistic in nature, it was suggested that PsyCap is more than a sum of its parts. Previous studies showed, for example, that PsyCap predicts outcomes above and beyond individual components (Finch et al., 2020; Luthans et al., 2007a, b)—the pattern of results that aligns with theoretical underpinnings stemming from the Conservation of resources theory (Hobfoll, 2011; Hobfoll et al., 2018). According to this theory, individuals strive to protect and accumulate the resources necessary to achieve their goals. These resources—the four psychological strengths—are interconnected and reinforce each other during individual development, creating a specific resource caravan, the PsyCap.

Three main themes, namely agentic goal pursuit, a sense of control, and intentionality, have been suggested as shared aspects that integrate the four components of PsyCap (Luthans & Youssef-Morgan, 2017; Luthans et al., 2007a, b). This makes psychological capital especially relevant in research on goal-striving, as discussed below. However, although this synergistic effect is of main interest here, the separate roles of the four components could also be examined in this framework, as some authors suggest that analyzing the specific role of every component of PsyCap could be beneficial. For example, Dawkins et al. (2013) stressed that examining four components of PsyCap should be integrated into forthcoming investigations to bolster predictive accuracy and broaden comprehension concerning the potential mechanisms. This is crucial in the present context as some potentially important conceptual differences have been suggested between the four components of PsyCap.

Based on the conceptual analysis provided by Rand (2018), it can be argued that hope, optimism, and self-efficacy are cognitive in nature, goal-directed, and oriented toward the future to some degree. However, the level of generalization and intention to perform a behavior is much

lower in self-efficacy. The lack of intentionality is also the case with optimism to some degree, but optimism also relates to focusing on oneself to a lesser degree and is also based on perceived ability to a lesser degree. Similarly, it can be argued that resilience is related to intentionality to a lesser degree but is also less goal-oriented and future-oriented. The differences between these variables have been indicated by previous research in various contexts (see, Rand, 2018, for a detailed review) but are especially relevant in the context of action crisis and goal progress. As such, the following questions could be important when considering ongoing goal striving and facing obstacles during goal pursuit by individuals as discussed below: (A) Do I have confidence in my abilities to achieve my goals (self-efficacy)? (B) Am I motivated to pursue my goals, and do I have strategies to reach them (hope)? (C) Do I generally expect that good things will happen in the future (optimism)? (D) Can I withstand and bounce back from difficulties and challenges (resilience)?

Action crisis

In many situations, goal striving is not without problems. An *action crisis* emerges when problems accumulate, and the individual reconsiders whether the goal is still worth pursuing. Specifically, according to Brandstätter and Herrmann (2018), an action crisis represents a decisional conflict between giving up vs. persisting in a problematic goal pursuit. As such, action crisis was suggested as a promising approach to examining disengagement processes, i.e., potential antecedents, consequences, mediation, and moderating mechanisms (Herrmann & Brandstätter, 2015). Action crisis is operationalized via the Action Crisis Scale (ACRISS) (Brandstätter & Schüler, 2013; Brandstätter et al., 2013; Herrmann & Brandstätter, 2013). The scale focuses on several aspects, such as setbacks occurrence, decisional conflict, rumination, implemental disorientation, procrastination, and disengagement impulses (Brandstätter & Bernecker, 2022; Brandstätter et al., 2013; Holding et al., 2017).

Previous research has identified various consequences of an action crisis. Although action crisis can also lead to positive benefits in the long run as futile goals are abandoned more easily, the nomological network includes mainly negative aspects such as depressive symptoms (e.g., Holding et al., 2017, 2021), lower levels of well-being (e.g., Brandstätter et al., 2013; Herrmann & Brandstätter, 2013), higher levels of cortisol secretion (e.g., Brandstätter et al., 2013; Holding et al., 2021), or even poorer physical health and slowing down of the healing process (e.g., Brandstätter et al., 2013; Holding et al., 2021; Wolf et al., 2019), among others.

An action crisis is based on former theories of processes related to goal disengagement (Klinger, 1975). While there is evidence that goal disengagement could be predicted by an action crisis (Herrmann & Brandstätter, 2015), not every action crisis necessarily leads to goal disengagement in all situations. Rather, an action crisis changes the implemental mindset towards a more deliberative state of mind, allowing individuals to express cost–benefit thinking without proverbial 'rose-tinted glasses' (Brandstätter & Schüler, 2013; Herrmann et al., 2014). More specifically, according to the mindset theory of action phases (Gollwitzer & Keller, 2016; Keller et al., 2019), individuals go through pre-decisional, pre-actional, actional, and post-actional phases during goal pursuit with a different mindset. For example, while consideration of desirability and attainability is present in the pre-decisional phase but no longer in the actional phase, the accumulation of setbacks can shift the mindset back, and attainability and desirability are re-considered in the action phase, hindering further goal progress.

Although there was much less research attention devoted to the role of possible protective factors than to outcomes, previous studies have identified several individual difference variables that have the potential to shield an individual from developing an action crisis (see, e.g., Holding et al., 2017, 2021; Herrmann et al., 2014; Herrmann & Brandstätter, 2013; Marion-Jetten et al., 2022; Wolf et al., 2019). For example, in their longitudinal study, Wolf et al. (2018) found that the general self-efficacy of students (or, more precisely, the shared variance between self-efficacy and action orientation) reduced the development of an action crisis over the course of the semester. However, as discussed above, other variables conceptually related to self-efficacy can protect an individual from losing the positive overview during the action phase, prevent the regression of the mindset, and support progress toward the goal. In particular, we expect that self-efficacy, optimism, hope, and resilience—and their share variance in terms of agentic goal pursuit, a sense of control, and intentionality as captured by the PsyCap (Luthans and Youssef-Morgan (2017); Luthans et al., 2007a, b; —could be important in the present context due to their intentional, proactive and goal-oriented nature.

Beyond that, several more specific mechanisms could be nominated and examined considering the extended nomological network of an action crisis in terms of previously established potential predictors of action crisis. For example, cognitive appraisals have been nominated as a potential mechanism explaining the role of PsyCap in various outcomes (Youssef-Morgan & Luthans, 2013). Previous research also documented that lower evaluation of goal attainability (but not desirability) contributes to an increase in the experience of an action crisis (Brandstätter & Herrmann, 2016; Brandstätter et al., 2013; Ghassemi et al.,

2017). This is an important finding in the present context as PsyCap should contribute to evaluating goal attainability more positively and, thus, indirectly, shielding an individual from developing an action crisis.

Besides goal attainability, there are other possible mechanisms through which PsyCap could influence the development of action crises. For example, autonomous motivation has been systematically shown to protect against the development of an action crisis in previous research, while controlled motivation served as a risk factor (Holding et al., 2021; Marion-Jetten et al., 2022; Wolf et al., 2018). PsyCap has been shown to contribute to autonomous and controlled motivation, and this pattern is indirectly linked to outcomes such as academic performance (Datu et al., 2018; Liu & Huang, 2022).[1] Furthermore, previous studies indicated that various other mechanisms, including emotions and agentic conation, could be important when explaining the role of PsyCap (Luthans et al., 2007a, b). Thus, potential mediators, such as autonomous and controlled motivation, goal-related emotions, and effort expenditure, can also be considered important in the present context.

Present set of studies

The present research utilizes the integrative framework of PsyCap to examine the role of four positive psychological strengths – optimism, hope, self-efficacy, and resistance—in an action crisis. Based on the literature review provided above, we expected that PsyCap would serve a protective role during goal striving, and as such, it will be negatively associated with action crisis and positively associated with goal progress. Furthermore, based on the established nomological network of an action crisis, we aimed to examine its relationship to selected variables as a potential mechanism to explain the relationship between PsyCap and action crisis.

Specifically, our approach involves (a) examining the relationships between PsyCap and action crisis, (b) assessing if the pattern of results replicates across different contexts, and (c) beyond demographic information and selected personality traits. Furthermore, we (d) focus on the indirect role of goal attainability as a potential mechanism throughout the PsyCap operates and (e) explore four additional potential mediators – negative goal-related emotions, effort expenditure, and autonomous and controlled motivation. Moving beyond the specific operationalization of crisis, we also (f) examine goal progress as a more general variable related to the goal-striving process. We further (g) examine mutual associations between PsyCap and action crisis longitudinally, differentiating between-person effect and within-person fluctuations in a random intercept cross-lagged model. These goals are summarized in the Table 1 below, while more specific information is elaborated in the introduction to every study.

Study 1 (Pilot study)

The main aim of the pilot study was twofold. First, we sought to establish the relationship between psychological capital (PsyCap) and the experience of an action crisis. While previous research supported the role of general self-efficacy in an action crisis (Wolf et al., 2018), the systematic examination of additional interrelated positive psychological constructs (i.e., hope, optimism, and resilience)—and their overlap in terms of PsyCap—remains unexplored.

PsyCap is a particularly meaningful construct in this context, providing a cohesive and parsimonious approach. It captures the effect of the four components of PsyCap previously described by Luthans and Youssef-Morgan (2017) as agentic goal pursuit, a sense of control, and intentionality. As these aspects are crucial in goal-directed behavior, it was hypothesized that PsyCap would be negatively related to the occurrence of an action crisis during the pursuit of an academic goal (H_1).

Secondly, it was suggested that a more detailed examination of the four components of PsyCap could be of theoretical importance (see, e.g., Dawkins et al., 2013). As hope, optimism, self-efficacy, and resilience conceptually differ in some respects (Rand, 2018), we were interested in exploring the idiosyncratic effects of four HERO components in relation to the experience of action crises. This part was exploratory. The first exploratory research question asked: Which components are related to action crises and to what degree (Q1)? In analysis, we use both classical frequentist and Bayesian analysis, as Bayesian analysis allows us to quantify the evidence for null and alternative hypotheses.

Method

Sample

The first study's sample consisted of 295 university students with a mean age of 25.78 years (Med = 24, Mode = 23 years, SD = 6.31 years). 63% (223 people) of the sample were women. The questionnaire was distributed online via social media. Convenience sampling and a cross-sectional design were used. The sample size was determined by power analysis.[2]

[1] We are thankfull to reviewer to pointing our attention also to the role of autonomous/controlled motivation.

[2] Power analysis was conducted in Web-power (Zhang, 2018). N = 260 participants were estimated to be sampling goal to find the effect of "some explanatory and practical use even in the short" (Funder &

Table 1 Overview of studies

Study	The main aims	Research questions and hypotheses
Study 1 (Pilot study)	The first study aimed to (A) establish the association between PsyCap and the action crisis and (B) establish a link between an action crisis and four HERO components—hope, optimism, self-efficacy, and resilience.	PsyCap would be negatively linked to the occurrence of an action crisis during the pursuit of an academic goal (H_1). Which HERO components are related to action crises, and to what degree (Q_1)?
Study 2 (Direct replication and extension)	The main aims of the second study were to (A) replicate the link between PsyCap and action crisis in another sample and use an analysis that accounts for demographic information and (B) examine the indirect link with the potential mediator—goal attainability. The study also aimed to (C) examine whether the role of four HERO components replicates and (D) whether specific components will explain the variance of action crises beyond and above PsyCap.	The link between PsyCap and action crisis would be replicated; but goal attainability (and not goal desirability) would explain the significant portion of variance between the PsyCap and action crisis (H_2). Which predictors (i.e., HERO components) can be nominated as the best predictors of action crisis (Q_2)? Would some specific components explain the variance of action crisis beyond and above PsyCap (Q_3)?
Study 3 (Conceptual replication and extension)	The aims of the third study were to (A) replicate the link between PsyCap and action crises with different operationalizations in different culture and when accounting for stable personality traits and (B) extend the results to more general goal progress. The study also aimed to examine the role of four components in (C) action crisis and (D) goal progress.	The link between PsyCap and the action crisis will be replicated; but it was also expected that PsyCap is not only negatively related to the action crisis but also positively related to the subjective assessment of the progress made toward the goal (H_3). Will the role of these components be replicated and extended to the goal progress (Q4)?
Study 4 and Study 5 (Conceptual replications and extensions)	The fourth and fifth study aimed to (A) replicate the link between PsyCap and action crises concerning different goals and age groups and (B) extend the nomological network regarding four additional potential mechanisms.	The link between PsyCap and action crisis/goal progress, as well as the indirect role of goal attainability, would replicate; but is this indirect link mediated also via negative goal-related emotions (O_5), goal effort (O_6), autonomous (O_7) and controlled motivation (O_8)?
Meta-analytic summary	The main aim of the mini meta-analysis was to provide a meta-analytic summary of the link between PsyCap/its HERO components and action crisis over several studies.	What is the average size of the link effect between PsyCap/HERO components and action crisis (O_9)?
Study 6 (Longitudinal extension)	The main aim of the sixth study was to longitudinally examine bidirectional relations between PsyCap and action crises in time.	Can the individual deviation from the expected level of action crisis be predicted from prior deviation from expected scores in PsyCap while separating within-person variability from between-person differences? Are changes in PsyCap related to changes in action crisis within the same individual, or are trait-like differences between individuals more important (Q_{10})?

Instruments

Psychological capital was operationalized using the gold standard of PsyCap research, the Psychological Capital Questionnaire (PCQ) (Luthans et al., 2007a, b). In particular, the academic version of PCQ in Hebrew was used (Hazan-Liran & Miller, 2019, 2020). The questionnaire consists of 24 items covering four capacities – hope (e.g., 'I can think of many ways to reach my current study goals'), self-efficacy (e.g., 'I feel confident analyzing a study-related long-term problem to find a solution'), optimism (e.g., 'I'm optimistic about what will happen to me in the future as it pertains to my studies'), and resilience (e.g., 'There are lots of ways around any study-related problem'). The items were rated on a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree). The internal consistency of the whole scale was excellent (Mcdonald's ω = 0.92), while the internal consistency for specific subscales was very good to good (ω = 0.85 for self-efficacy, 0.81 for hope, 0.77 for optimism, and 0.93 for resilience).

Participants were asked to list one goal related to their studies that is important to them and that they actively pursue. A*ction crisis* was operationalized using the Action

Ozer, 2019, p. 166) (r = .20), with p-vale of .05 and 95% power. The power was set to 95% threshold as we wanted to be 95% sure that we will find the effect if the effect exists.

crisis scale (ACRISS) (Brandstätter & Schüler, 2013; Brandstätter et al., 2013; Herrmann & Brandstätter, 2013). The ACRISS consists of six items (e.g., 'When striving for this goal, I am repeatedly confronted with situations where I do not know how to continue'), covering implemental disorientation, procrastination, disengagement impulses, rumination, conflict, and setbacks. The items were rated on a seven-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree). The scale was translated into Hebrew using the forward–backward translation procedure. The internal consistency of the scale was considered acceptable but slightly less than optimal (McDonald´s $\omega = 0.69$). Although the internal consistency is slightly below 0.7, we decided to work with this scale as longer scales generally have lower internal consistency. Also, the crisis is more a state consisting of various indicators rather than a consistent interpersonal disposition (see discussion).

Results

To examine H_1, we computed the correlation between PsyCap and action crisis. To examine the first research question, we computed correlations between sub-components of PsyCap and action crisis. Analysis was conducted in JASP software (JASP Team, 2022). The descriptive statistics can be found in Appendix A on OSF.

Establishing a relationship between PsyCap and action crisis

The Pearson correlation coefficient has been used to examine the first hypothesis. As hypothesized, PsyCap was negatively related to action crisis ($r = -0.57$, $p < .001$, 95%CI [-0.48, -0.66]). In particular, based on the p-value, the null hypothesis could be rejected. Also, the Bayes factor indicated extreme evidence for H_1 over H_0 ($BF_{01} = 9.34 \times 10^{+17}$). The credible interval indicated that there is a 95% probability that the true (unknown) estimate would lie within the interval [-0.48, -0.65], given the evidence provided by the observed data. This pattern of results supports H_1.

Establishing the relationship between four components and action crisis

In the second step, we were interested in which subscale would correlate with the action crisis and to what degree (Q_1). As seen in Appendix B on OSF, all four components of PsyCap were negatively related to action crisis (all had $p < .001$ and with extreme evidence for H_1 over H_0 - $BF_{10} > 100$). The effect sizes were in a range of $r = -0.41$ to -0.55, with hope and self-efficacy ($r = -0.55$) being the strongest predictors and optimism and resilience correlated with an action crisis to a slightly lower degree ($r = -0.49$ and -0.50, respectively). The size of the effect is still considered a (very) large effect, according to Funder and Ozer (2019).

Study 2 (Direct replication and extension)

In a pilot study, we found several promising findings. For example, we found the initial support for the hypothesis that PsyCap is negatively linked to an action crisis. According to the benchmarks provided by Funder and Ozer (2019), based on the assumption that the effect accumulates over time, the effect size can be interpreted as very large, suggesting that it could be potentially powerful in both the short and long run. However, Funder and Ozer (2019) also caution that large effects in psychology could be overestimated and rarely replicate. Therefore, the main objective of the second study was to directly replicate and further extend the role of PsyCap in an action crisis in a theoretically meaningful way.

More specifically, based on previous research, we hypothesized that selected goal-related cognitions could serve as potential mediators in the relationship between psychological capital and action crisis. Cognitive appraisals have been suggested as a potential mechanism explaining the role of PsyCap in various outcomes in previous studies (Youssef-Morgan & Luthans, 2013), and hope, self-efficacy, resilience, and optimism are, to various degrees, embedded in expectancy-value approaches and self-regulation. Thus, based on previous studies dedicated to action crisis (Brandstätter & Herrmann, 2016; Brandstätter et al., 2013; Ghassemi et al., 2017), we chose goal attainability as a candidate mediator, as these studies have systematically shown that low goal attainability predicts action crisis. For example, in their longitudinal study, Ghassemi et al. (2017) found that desirability and goal attainability change due to an action crisis, but only goal attainability predicted a later increase in an action crisis. Thus, to provide a riskier prediction and account for other factors, we also included the goal desirability but did not expect that desirability would mediate the relationship between PsyCap and the action crisis unless other factors (i.e., common method bias) or mechanisms not related to the change in evaluation of feasibility caused by PsyCap are in play.

In particular, it was expected that the degree to which an individual considers the goal at hand attainable should be determined by the level of PsyCap he possesses—as cognitive appraisals related to positive attributions about success (optimism), confidence to take on and put in the necessary effort (self-efficacy), persevering toward goals, redirecting paths when necessary (hope), and bouncing back and beyond (resiliency) (Luthans et al., 2006b)—and their shared variance in terms of sense of control, intentionality

and agentic goal pursuit (Luthans & Youssef-Morgan, 2017)—could be considered as important prerequisites for evaluating the goal during goal striving as attainable. Consequently, the positive evaluation of a goal as attainable by an individual should not trigger an action crisis to the same degree as a goal that is considered unattainable (Brandstätter & Herrmann, 2016; Brandstätter et al., 2013; Ghassemi et al., 2017). However, this rationale does not apply to goal desirability as this should not cause an action crisis, nor should it be strongly influenced by PsyCap.

Therefore, in the follow-up study (the so-called Replication-Extension study; Bonett, 2012), we hypothesized that psychological capital would be negatively associated with an action crisis (i.e., *direct replication* of the main result from the first study and H_1). However, we also expected that goal attainability, but not goal desirability, would explain the significant portion of variance between the PsyCap and action crisis (H_2) (i.e., *an extension of the first study*). It was expected that higher levels of PsyCap would be associated with more attainable goals and more attainable goals would be linked with lower levels of action crisis experienced by the individual, but this would not apply to goal desirability. To ensure more robust evidence, the study was pre-registered.[3]

In an exploratory fashion, we were also interested in which (set of) predictors can be nominated as best model (Q_2)? To address these questions, we conducted more complex Bayesian multi-model linear regression (Bergh et al., 2021). Bayesian multi-model linear regression provides several benefits, including the capacity for model averaging, which enhances predictive generalizability and confers robustness against model uncertainty. This is important, especially in exploratory settings. We were also interested in the role of all four components of PsyCap replicates and whether some specific component/s will explain the variance of action crisis beyond and above PsyCap (Q_3).

Method

Sample

The sample consisted of $N = 210$ university students with $M_{age} = 26.36$ years (Med = 26, Mode = 24 years, $SD_{age} = 4.18$, 72% were female). As in previous research, the participants were approached via social media and convenience sampling and a cross-sectional design were used. The sample size was determined based on power analysis.[4]

Instruments

As in the previous study, *Psychological capital* was operationalized using the Psychological Capital Questionnaire (PCQ) (Luthans et al., 2007a, b). The internal consistency for the scale was McDonalds´s $\omega = 0.93$. The participants were asked to report one important goal related to their studies. They also had to report the level of crisis in their goal (action crisis), how much they wanted to attain this goal (goal desirability), and the degree to which they thought that the goal would be attainable (goal attainability). As before, *action crisis* was assessed by the Action crisis scale (ACRISS) (Brandstätter & Schüler, 2013; Brandstätter et al., 2013; Herrmann & Brandstätter, 2013). The internal consistency of the scale was considered as good (McDonalds´s $\omega = 0.76$). *Goal attainability* was assessed using three items (e.g., 'Achieving this goal seems difficult to me'). The internal consistency was Mcdonald's $\omega = 0.68$. *Goal desirability* was assessed through three items (e.g., 'Even compared to other goals, this goal still has top priority'). The items were adapted from Brandstätter and Herrmann (2016). The internal consistency was Mcdonald's $\omega = 0.82$. Scales were rated on a seven-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree).

Results

We examined whether the relationship between PsyCap and the action crisis replicates when basic demographic information is accounted for. Next, we also examined the hypothesized indirect role of goal attainability in the relationship between PsyCap and action crisis (H_2). Furthermore, we examined whether the role of the four components of PsyCap in action crisis replicates and if some component (e.g., hope) will be associated (i.e., will predict) with action crisis (Q_2) and if the components will predict and action crisis above and beyond PsyCap (Q_3). The analysis was performed using JASP software (JASP Team, 2022). The descriptive statistics can be found in Appendix A on OSF.

Replicating and extending the relationship between PsyCap and action crisis

Directly replicating previous findings, PsyCap was negatively correlated with action crisis ($r = -0.57$, $p < .001$, the 95%CI [-0.43, -0.68]). Based on the p-value, we could reject the null hypothesis. Bayes factor indicated extreme evidence for H_1 over H_0 ($BF_{01} = 1.78 \times 10^{+9}$). The credible interval indicated that there is a 95% probability that

[3] Pre-registration can be found at https://osf.io/gtb27/?view_only=317c681b252845ffa7817b050b73d0b7

[4] Considering the effect from previous studies and power analysis for simple correlation, linear regression, and mediation analysis, we wanted to sample at least 175 participants. Note, however, that for the main analysis (replication of previous results with regression analysis as an analytical tool), N = 67 should be sufficient considering 95% power, a p-value of 0.001, and $R^2 = .34$.

the true (unknown) estimate would be within the interval [-0.43, -0.67], given the evidence provided by the observed data. Thus, we also found support for H_1 in this study.

A hierarchical linear regression analysis was performed to account for basic demographic variables. In this case, the frequentist approach has been chosen as pre-registrated.[5] The block with age and gender was not found to be statistically significant ($F(3, 86) = 1.00$, $p = 0.393$, $R^2_{adj} = 0.03$). When psychological capital was added to the model in the second step, the model was statistically significant ($F(3, 84) = 13.367$, $p < .001$, $R^2_{adj} = 0.34$) and explained 30% more variance of the action crisis compared to the first step (the difference between the two models was statistically significant $F(1, 84) = 36.012$, $p < .001$, $\Delta R^2 = 0.30$). The model coefficients are shown in Table 2. An increase in one unit of the psychological capital scale was associated with a one-unit decrease in the severity of an action crisis (B = -1.1, SE = 0.018, $p < .001$ 95%CI [-1.46, -0.73]). In fact, Bayesian regression, conducted as a sensitivity analysis (see online Appendix on OSF), indicated that a model with PsyCap is preferable over the null model ($BF_M = 205{,}540$).

Examining the indirect effect of goal attainability in the relationship between PsyCap and action crisis

To extend the results of study one in a theoretically meaningful way, simple mediation analysis was carried out with psychological capital as the predictor (X), action crisis as the criterion variable (Y), and goal attainability and goal desirability as non-sequential mediators (M). This was done in the JASP SEM modul with 5000 bootstraps replication and the Bias-corrected percentile method. In line with the previous analysis, the results indicated that there is a link between psychological capital and action crisis (total effect) (β = -0.95; SE = 0.12; $p < .001$ CI [-1.19, -0.72]). Importantly, there was an indirect effect found through goal attainability (β = -0.26; $p = .003$ CI [-0.47, -0.11]), but not goal desirability (β = -0.05; $p = .122$ CI [-0.14, -0.01]) as expected in H_2. This means that the more psychological capital an individual possessed, the more they perceived the goal as attainable and the less severe crisis they experienced. However, it should be noted that although the effect size will be reduced when accounting for two potentially theoretically important mediators are taken into account, the relationship between psychological capital and action crisis remains significant, as indicated by the coefficient of the direct effect (β = -0.64; $p < .001$ CI [-0.93, -0.36]).

Replicating and extending the role of HERO components in action crisis

Also, in accordance with the previous analysis, the four components were negatively related to action crisis (all $p < .001$; extreme evidence for H_1 ($BF10 > 100$), with an effect size in a range of $r = -0.42$–59). Hope was most strongly correlated with action crisis ($r = -0.59$, 95%CI [-0.43, -0.70]), but optimism ($r = -0.50$, 95%CI [-0.35, -0.62]), self-efficacy ($r = -0.47$, 95%CI [-0.33, -0.60]), and resilience ($r = -0.42$, 95%CI [-0.27, -0.56]) had slightly lower but still relatively big effect size. All four components were also related to goal attainability (all $p < .001$; extreme evidence for H_1 ($BF_{10} > 100$); with effect size in a range of $r = -0.38$–55). As previously, the correlation matrix can be found in Appendix B on OSF.

Bayesian linear regression was used to examine further the role of the four components of PsyCap (Q_2).[6] Gender and age were added in the first step to the null model as we wanted to account for basic demographic information, while four psychological capital subscales were added in the second step. The results indicated that the model with hope was preferred over other hypothetical combinations. In particular, the data provided support for this model ($BF_M = 60.87$) and explained 39% of the variance of an

Table 2 Model coefficients

Model		Unstandardized	Standard Error	Standardized	t	p	95% CI Lower	95% CI Upper
H_0	(Intercept)	3.70	0.87		4.24	5.71e-5	1.96	5.43
	Age	-0.04	0.03	-0.16	-1.52	0.13	-0.10	0.01
	Gender	0.18	0.26	0.08	0.70	0.48	-0.34	0.71
H_1	(Intercept)	7.50	0.97		7.73	2.09e-11	5.57	9.42
	Age	-0.01	0.02	-0.04	-0.44	0.66	-0.06	0.04
	Gender	-0.14	0.23	-0.06	-0.60	0.55	-0.59	0.32
	PsyCap	-1.10	0.18	-0.57	-6.00	4.80e-8	-1.46	-0.73

[5] Note that not every person answered all questions. Furthermore, some participants did not answer the question related to age due to error in the questionnaire. Therefore, as the list-wise procedure was implemented, the final sample for analysis was diminished. Although it was possible to omit age from the analysis and increase N in analysis, we stick to pre-registration as we still should have sufficient power to detect the main effect of interest in this study.

[6] JZS prior (r = 0.354) and Beta binomal prior was used in this and subsequent analysis.

action crisis. However, this model is only four to six times better than a model combining hope with self-efficacy, resilience, or optimism (see the online Appendix C). Bayesian model-averaged analysis indicated that the model with hope is much more probable than models without this variable ($BF_{inclusion} = 894.36$) in contrast to other predictors.

Furthermore, in an exploratory fashion, we accounted for PsyCap to assess the role of individual component-specific variance beyond and above PsyCap (Q_3). When PsyCap is taken into account, Hope remained a statistically significant correlate ($r = -0.24$, $p < .01$) of the action crisis, but other components were not. Also, the results of Bayesian linear regression indicated that when PsyCap, age, and gender are accounted for, a model with Hope as the only potential predictor of action crisis was the best, favoring this factor. The data provided moderate support for this model ($BF_M = 9.29$). However, although this model was much better than the null model, it was only marginally (two to three times) better compared to other combinations –e.g., hope and self-efficacy, resilience, and optimism. Bayesian model-averaged analysis indicated that the model with hope is much more probable than models without this variable ($BF_{inclusion} = 9.02$), while other components are inconclusive.

Study 3 (Conceptual replication and extension concerning incremental validity over selected personality traits and extension of the nomological network to goal progress)

In the previous two studies, the action crisis was negatively associated with PsyCap. However, in both studies, psychological capital was operationalized by the Psychological Capital Questionnaire (PCQ) (Luthans et al., 2006b) adapted to the academic context (Hazan-Liran & Miller, 2019, 2020). Here, it was of interest to see if the results would generalize beyond this specific operationalization and if this pattern of results would also replicate with regard to another related criterion variable that is more general than action crisis, goal progress (so-called conceptual replication; Crandall & Sherman, 2016). It is important to mention that some variables, like optimism, have been shown in previous research to affect goal progress positively. For example, Monzani et al. (2015) found that dispositional optimism was related to goal progress and commitment via expectancy changes – the rationale also employed in study 2 with regards to action crisis.

Although the Psychological Capital Questionnaire is the most common operationalization of PsyCap, alternative operationalizations can be found in the literature. Thus, we used the Compound Psychological Capital Questionnaire-Revised (CPC-12R) in the third study. The CPC-12 was proposed by Lorenz et al. (2016) to address some of the PCQ's limitations and was consequently revised by Dudasova et al. (2021a). Besides the operationalization of PsyCap, it is worth noting that the first two studies were conducted in the Hebrew language, while the third was done in a different language and culture. The third study, and remaining studies, were conducted in Slovakia. We expected results to be robust (i.e., the same pattern of results will occur) when different operationalizations of PsyCap in a different country are used. Nevertheless, we also expected that results would be conceptually convergent with regard to different and more general outcome variables as a criterion variable – the goal progress. In particular, we hypothesized that PsyCap is not only negatively related to action crisis, but will also be positively related to subjective assessment of the progress of a goal of an individual (H_3) as it was expected that PsyCap not only shields from the development of crisis, but this caravan of valuable resources also facilitate the goal striving toward successful goal attainment.

Moreover, to establish that the relationship between PsyCap and action crisis is not only robust but also a theoretically meaningful predictor, we aimed to provide evidence that PsyCap predicts action crisis over and above more stable variables established in previous research. For this reason, we selected two Big-five personality traits—namely conscientiousness and negative emotionality – as these traits have been established in the context of the action crisis as risk and protective factors, respectively (Holding et al., 2017; Kačmár et al., 2023). Furthermore, they are well established in the context of PsyCap and specifically concerning the CPC-12 scale (see Lorenz et al., 2016).

Moreover, as in previous studies, we also examined the role of the four components of PsyCap in both action crises and goal progress via different operationalization. We were interested in whether the role of these components will be replicated and extended to goal progress (Q_4).

Method

Sample

The sample consisted of $N = 411$ participants with $M_{age} = 23.15$ years (Med = 23, Mode = 19 years, $SD_{age} = 3.79$, 84% female). As in the previous case, the participants were approached through social media, convenience sampling and a cross-sectional design were used.[7]

[7] Considering the size of the effect from previous studies and minimal effect size of interest, the minimal sample size was similar to previous study.

Instruments

Psychological capital was assessed using the CPC-12R (Dudasova et al., 2021a; Kačmár et al., 2023). The scale consists of 12 items covering hope (e.g., 'I can think of many ways to reach my current goals'), self-efficacy (e.g., 'I am confident that I could deal efficiently with unexpected events'), optimism (e.g., 'Overall, I expect more good things to happen to me than bad'), and resilience (e.g., 'After serious life difficulties, I tend to quickly bounce back'). Participants were instructed to think about their studies and rate 12 items on 6-point Likert scale (ranging from 1 = strongly disagree to 6 = strongly agree). The internal consistency for the entire scale was excellent (McDonalds´s ω = 0.93).

The action crisis was assessed by the ACRISS (Brandstätter & Schüler, 2013; Brandstätter et al., 2013; Herrmann & Brandstätter, 2013) as before. Items were rated on a seven-point Likert scale. The scale's internal consistency was McDonald´s ω = 0.76. Goal progress was operationalized by a slider (0 to 100), where participants listed where they were in the pursuit of the goal at the moment.

Negative emotionality (e.g., 'Tends to feel depressed, blue'; McDonald´s ω = 0.82), and *conscientiousness* (e.g., 'Is persistent, works until the task is finished'; McDonald´s ω = 0.77) were assessed via BFI-II short (Kohút et al., 2020; Soto & John, 2017). Participants rated the extent to which they agreed with each statement on a 5-point scale (ranging from 1 = strongly disagree to 5 = strongly agree).

Results

We first examined whether the link between PsyCap and action crisis conceptually replicates. Second, we examined the role progress as an alternative outcome variable and the incremental validity of PsyCap above and beyond selected personality traits via linear regression analysis. Results were analyzed in jamovi software (The jamovi project, 2024) and JASP software (JASP Team, 2022). Descriptive statistics can be found in the Appendix A on OSF.

Conceptually replicating the relationship between PsyCap and action crisis

Conceptually replicating previous findings, PsyCap was negatively related to the action crisis (r = -0.41, p < .001, 95%CI [-0.31, -0.50]). Based on the p-value, we could reject the null hypothesis. The Bayes factor indicated extreme evidence for H_1 over H_0 ($BF_{01} = 6.38 \times 10^{+9}$). The credible interval indicated that there is a 95% probability that the true (unknown) estimate would lie within the interval [-0.31, -0.50], given the evidence provided by the observed data. Although the effect size was slightly lower than in the previous two studies, it still could be categorized in the same manner—as a very large effect (Funder & Ozer, 2019).

In the next step, frequentist hierarchical linear regression has been conducted to extend previous studies with respect to the notion of incremental validity considering selected personality traits. Psychological capital was expected to be negatively associated with an action crisis even when the demographics and selected personality traits were accounted for. Therefore, age and gender were added in the first step, as in the previous study, and conscientiousness and negative emotionality as selected personality traits were added in the second step. PsyCap was added to the third block.

The results indicated that the demographic model was not statistically significant (F (2, 266) = 0.45, p = .639, R^2_{adj} = 0.001)—neither age nor gender significantly predicted an action crisis (all p > .05). However, as expected based on previous studies, when conscientiousness and negative emotionality were added to the model in the second step, the model was statistically significant (F (4, 264) = 14.96, p < .001, R^2_{adj} = 0.17). The difference between the two models was also statistically significant (F (2, 264) = 29.37, p < .001, ΔR^2 = 0.18). Consistent with previous studies, an increase in one-unit conscientiousness was associated with a 0.34 point decrease of severity in the experience of an action crisis (B = -0.34, SE = 0.09, p < .001, 95% CI [-0.34, -0.10]), while an increase in one-unit in negative emotionality was associated with a 0.37 point increase of severity in the experience of an action crisis (B = -0.37, SE = 0.09, p < .001, 95% CI [0.14, 0.40]). When PsyCap was added in the last step, the model was statistically significant (F (5, 263) = 15.30, p < .001, R^2_{adj} = 0.21) and explained 21% of the total variance of action crisis (the difference between the two models was also statistically significant F (1, 263) = 13.76, p < .001, ΔR^2 = 0.04, explaining an additional 4% of variance). As shown in Table 3, PsyCap, conscientiousness, and negative emotionality were statistically significant predictors (i.e., an increase in PsyCap was associated with a 0.36-point decrease in an action crisis, while the role of conscientiousness and neuroticism was weaker).

Although R^2 increase was not substantial (only approximately 4%), Bayesian linear regression indicated that the model with PsyCap is more than 100 times better (extreme evidence) than a null model with all other variables included in a null model. Moreover, when the Bayesian model-averaged analysis with all possible predictors is conducted, the model with PsyCap is more than 100 times more probable than models without this variable (BF_{inc} = 267.62); while the model with conscientiousness is 6 times more probable (BF_{inc} = 5.68), and model with neuroticism is only two times (BF_{inc} = 2.38) more probable than models without these variables.

Table 3 Model coefficients for action crisis as criterion variable

						95% Confidence Interval	
Predictor	Estimate	SE	*t*	*p*	Stand. Estimate	Lower	Upper
Intercept	5.59	0.79	7.11	< 0.001			
Gender:							
Female – Male	-0.21	0.20	-1.09	0.278	-0.17	-0.48	0.14
Age	-0.01	0.02	-0.46	0.643	-0.03	-0.13	0.08
Conscientiousness	-0.24	0.09	-2.59	0.010	-0.16	-0.28	-0.04
Neuroticism	0.21	0.09	2.30	0.022	0.16	0.02	0.29
PsyCap	-0.36	0.10	-3.71	< 0.001	-0.26	-0.39	-0.12

Table 4 Model coefficients for goal progress as a criterion variable

						95% Confidence Interval	
Predictor	Estimate	SE	*t*	*p*	Stand. Estimate	Lower	Upper
Intercept	11.11	19.26	0.58	0.565			
Gender:							
Female – Male	-1.72	4.76	-0.36	0.718	-0.06	-0.40	0.28
Age	0.68	0.44	1.55	0.123	0.09	-0.03	0.21
Conscientiousness	3.26	2.30	1.42	0.158	0.10	-0.04	0.23
Neuroticism	-1.98	2.22	-0.89	0.374	-0.07	-0.22	0.08
PsyCap	2.65	2.37	1.12	0.266	0.09	-0.07	0.24

Predicting goal progress by PsyCap when selected personality traits are accounted for

Next, hierarchical linear regression was performed with the subjective perception of goal progress as a criterion variable. The results indicated that the demographic model was not statistically significant ($F(2, 267) = 1.13$, $p = .324$, $R^2_{adj} = 0.001$). In this case, the model was also not significant when conscientiousness and negative emotionality were added to the model in the second step ($F(4, 265) = 14.96$, $p = .16$, $R^2_{adj} = 0.03$). Although the difference between the two models was statistically significant ($F(2, 265) = 29.37$, $p = .007$, $\Delta R^2 = 0.04$), age, gender, conscientiousness, nor negative emotionally were considered as significant predictors (all $p > .05$). When PsyCap was added in the last step, the model remained statistically significant ($F(5, 264) = 15.30$, $p = .020$, $R^2_{adj} = 0.03$), but the difference between the third and second block was not statistically significant $F(1, 264) = 1.24$, $p = .266$, $\Delta R^2 = 0.001$). As shown in Table 4, none of the four predictors was statistically significant when predicting progress instead of crisis when accounted for each other.

In fact, Bayesian linear regression indicated that the null model (will age, gender, conscientiousness, and negative emotionality) is slightly preferable over the mode where PsyCap is added; however, when the Bayesian model-averaged analysis with all possible combinations of predictors is conducted, evidence is inconclusive to anecdotal at best.

Further analysis of the role of four components in action crisis and goal progress

To further extend the results of previous studies with regard to components of PsyCap with regards to different operationalization, Bayesian linear regression was used. Age, negative emotionality, and conscientiousness were added in the first block, and four components were added in the second block. The results indicated that the various combinations of subscales of PsyCap were preferable over the null model with personality traits and age (the model explained 24% of the variance of an action crisis), but it was not possible to meaningfully distinguish between modes with various combinations (see the Appendix C on OSF). When all existing models are taken into account simultaneously via Bayesian model-averaged analysis, both optimism and hope emerged as potentially important predictors. According to the Inclusion Bayes factor, the model with optimism is nearly five times more probable than models without this variable, while the model with hope is only nearly three times more probable than models without this variable.

When goal progress is analyzed instead of action crisis, the data provided strong support for the null model with age, negative emotionality, and conscientiousness ($BF_M = 6.31$), but this model was only slightly better to model with components such as Hope ($BF_{01} = 1.60$), Optimism ($BF_{01} = 2.50$) or Self-efficacy ($BF_{01} = 2.97$) are added to the mix. When all the existing models are considered simultaneously via the Bayesian model-averaged analysis, none of

the components emerged as potentially important predictors. The posterior summary coefficients can be found in an Appendix C on OSF.

Study 4 and 5 (Conceptual replications and extensions focused on alternative mechanisms)

Previous three studies established that PsyCap is related to action crisis irrespective of operationalization, language, and culture. We also found that PsyCap remains a statistically significant predictor even when selected demographics and personality traits are accounted for. Furthermore, we showed that PsyCap is related to goal progress, but this was no longer conclusively true when other variables were accounted for. This relationship could be indirect, though. In fact, the results of the second study also indicated that the relationship between PsyCap and action crisis could be indirect – i.e., mediated by goal attainability. However, the relationship between the two variables remained significant even when attainability was taken into account, indicating that other potentially meaningful mediators could play an important role in the present context. Also, previous studies had several limitations hindering further generalizations. First, all goals examined so far were related to the study domain, which limits generalizability to other types of goals. Second, in previous studies, we sampled mainly university students. Thus, it is also important to determine whether this pattern will also replicate in younger students and a more general sample.

In the next two studies, we wanted to replicate the link between PsyCap and action crisis as well as the indirect role of goal attainability conceptually in different types of goals and samples and examined additional potential mechanisms in terms of goal-related emotions, autonomous and controlled motivation, and agentic conation. In particular, negative goal-related emotions, autonomous and controlled motivation, and effort that an individual puts into goal striving were examined as indirect effects as these variables could be important in the context of goal-directed behavior and action crisis (Austin & Vancouver, 1996; Brandstätter & Hennecke, 2018; Brandstätter & Herrmann, 2018; Holding et al., 2021; Marion-Jetten et al., 2022; Wolf et al., 2018) and PsyCap (Lorenz et al., 2016; Luthans & Youssef-Morgan, 2017). For example, it has been shown that controlled motivation is a risk factor in action crisis development, while autonomous motivation is considered a protective factor (Holding et al., 2021; Marion-Jetten et al., 2022; Wolf et al., 2018). Previous research also indicated that PsyCap predicts various forms of motivation (Datu et al., 2018; Liu & Huang, 2022) and is conceptually related to variables such as affect and engagement (Lorenz et al., 2016). We expected that the role of goal attainability as a potential mediator would be conceptually replicated in the fourth and fifth study with a different scale and in a different culture. We were also interested in whether the link between PsyCap and action crises/goal progress could also be explained, i.e., potentially mediated, via other candidate mediators: negative goal-related emotions (O_5), goal effort (O_6) in the fourth study, and autonomous (O_7) and controlled motivation (O_8) in the fifth study.

Method

Sample

The fourth study's sample consisted of $N = 272$ participants who were younger people, mainly secondary school students with $M_{age} = 16.87$ years (Med = 17, Mode = 18 years, $SD_{age} = 1.31$, 65% female), while the fifth study's sample consisted of $N = 268$ participants (more general population), $M_{age} = 28.31$ years (Med = 24, Mode = 24 years, $SD_{age} = 12.79$, 67% female). The participants were approached through social media. Convenience sampling and a cross-sectional design were used.[8]

Instruments

As in the previous study, *Psychological capital* was assessed using the CPC-12R (Dudasova et al., 2021a; Kačmár et al., 2022). McDonald´s ω = 0.89 and ω = 0.91; ω = 0.84 and 0.84 for optimism, ω = 0.82 and 0.80 for hope, ω = 0.76 and ω = 0.79 for self-efficacy, ω = 0.75 and ω = 0.81 for resilience in fourth and fifth study, respectively. *Action crisis* was assessed by the ACRISS (Brandstätter & Schüler, 2013; Brandstätter et al., 2013; Herrmann & Brandstätter, 2013) as before. The scale's internal consistency was McDonald´s ω = 0.69 for the fourth and ω = 0.60 for the fifth study. G*oal attainability* was measured by three items (e.g., 'Achieving this goal seems difficult to me') in the fourth study and 1 item in the fifth study. It was adapted from Brandstätter and Herrmann (2016). The internal consistency was McDonalds´s ω = 85. *Goal-related negative emotions* (study four) were assessed by two items (e.g., 'I feel tense when I think about this goal') adapted from Pomaki et al., (2004). The internal consistency, as assessed via Spearman-Brown's coefficient, was = 0.85. Effort expenditure (study four) was operationalized through one item ('I have tried really

[8] Considering the size of the effect from previous studies and minimal effect of interest as well as power analysis for simple correlation, linear regression, and mediation analysis; our minimal sample size was similar to previous study.

hard to achieve this goal') adapted from Werner et al. (2016). *Autonomous motivations* (i.e., 'Because of the fun and enjoyment which the goal will provide you – the primary reason is simply your interest in the experience itself'and (i.e., 'Because you really believe that it is an important goal to have – you endorse it freely and value it wholeheartedly') and *controlled motivations* (i.e., 'Because you would feel ashamed, guilty, or anxious if you did not – you feel that you ought to strive for this' and 'Because somebody else wants you to, or because you'll get something from somebody if you do') were operationalized via four items scale adapted from Milyavskaya et al. (2015). According to many authors, we used autonomous and controlled motivation instead of a self-concordance index as this approach is preferable, as a self-concordance index can hide the role of these two components (Koestner et al., 2008). The scale's internal consistency was estimated via Spearman-Brown's coefficient as 0.52 for controlled motivation and 0.54 for autonomous motivation. The goal progress was assessed by three items (e.g., I´ve made significant progress towards a goal) in the fourth study and slider in the fifth study. The internal consistency was McDonalds´s ω = 0.74. The scales were adapted to the Slovak language and used in previous research (e.g., Čopková et al., 2017). The items were rated on a seven-point Likert scale.

Results

With mediation analysis, we examined the indirect effects of goal attainability and two additional candidate variables – negative goal-related emotions and effort expenditure (in the fourth study) and autonomous and controlled motivation (in the fifth study)—in both action crisis and subjective assessment of a goal's progress. Analysis was conducted in JASP software (JASP Team, 2022). Descriptive statistics and more extensive results can be found in Appendix A on OSF.

Conceptually replicating and extending the role of potential mediators in action crisis

A mediation analysis was conducted with psychological capital as the predictor (X) and action crisis as the criterion variable (Y). However, in contrast to the second study, two additional potential mediators (M) were added in addition to the attainability of the goal (M_1): negative goal-related emotions (M_2) and the effort to reach the goal (M_3) and controlled motivation (M_4) and autonomous motivation (M_5).

The results of the fourth study indicated that there is a negative relationship between psychological capital and action crisis (total effect) (β = -0.48; $p < .001$ CI [-0.62, -0.34]). Importantly, the total indirect effect was significant (β = -0.37; $p < .001$ CI [-0.49, -0.26]) and the indirect effect was supported for all three variables, goal attainability (β = -0.19; $p < .001$ CI [-0.30, -0.11]), goal-related negative emotions (β = -0.10; $p = .001$ CI [-0.16, -0.05]) and effort expenditure (β = -0.08; $p = .02$ CI [-0.15, -0.01]). Specifically, PsyCap was negatively associated with negative goal-related emotions (β = -0.24; $p < .001$ CI [-0.37, -0.11]) and positively associated with effort expenditure (β = 0.54; $p < .001$ CI [0.41, 0.65]) and goal attainability (β = -0.67; $p < .001$ CI [0.49, 0.88]). Additionally, negative goal-related emotions were positively related to the action crisis (β = -0.41; $p < .001$ CI [0.30, 0.51]), while effort expenditure (β = -0.14; $p < .001$ CI [-0.26, -0.02]) and goal attainability (β = -0.28; $p < .001$ CI [-0.41, -0.16]) were negatively associated with the action crisis. The relationship between psychological capital and action crisis will no longer be significant when all three proposed mediators are accounted for (direct effect) (β = -0.11; $p = .13$ CI [-0.27, 0.05]) (i.e., a situation also known in classical approach to mediation analysis as a full mediation).

Similarly, there was a negative relationship between psychological capital and action crisis (total effect) (β = -0.35; $p < .001$ CI [-0.52, -0.18]) in the fifth study. Importantly, the total indirect effect was significant (β =–0.09; $p = .02$ CI [-0.20, -0.01]) and the indirect effect was supported for goal attainability (β = -0.08; $p = .003$ CI [-0.16, -0.01]) and controlled motivation (β = -0.05; $p = .003$ CI [-0.10, -0.01]), but not for autonomous motivation (β = -.03; $p = .17$ CI [-0.01, 0.09]) in the fourth study. PsyCap was negatively associated with controlled motivation (β = -.19; $p = .007$ CI [-0.35, -0.04]) and positively associated with attainability (β = 0.53; $p < .001$ CI [0.38, 0.66]) and autonomous motivation (β = 0.31; $p < .001$ CI [0.13, 0.50]). Additionally, controlled motivation was positively related to the action crisis (β = 0.23; $p < .001$ CI [0.11, 0.37]), while goal attainability was negatively associated with the action crisis (β = -0.14; $p = .03$ CI [0.28, 0.01]). The relationship between psychological capital and action crisis will remain significant when all three proposed mediators are accounted for (direct effect) (β = -0.26; $p < .001$ CI [-0.44, 0.09]) (i.e., indicating the potential role of other mediators).

Conceptually replicating and extending the role of potential mediators in goal progress

Next, a mediation analysis with goal progress as the criterion variable (Y) was also carried out. The results of the fourth study indicated that there is a negative relationship between psychological capital and subjective assessment of goal progress (total effect) (β = 0.63; $p < .001$ CI [0.52, 0.74]).

The total indirect effect was significant (β = 0.32; $p < .001$ CI [0.22, 0.43]), and all three variables accounted for the relationship between psychological capital and goal progress (this is true even when correction for multiple comparisons is applied). The indirect effect was supported for goal attainability (β = 0.16; $p < .001$ CI [0.08,0.25]), goal-related negative emotions (β = 0.05; $p = .009$ CI [0.02, 0.10]) and effort expenditure (β = 0.12; $p < .001$ CI [0.04, 0.21]). More PsyCap was associated with more attainment expectancies (β = 0.23; $p < .001$ CI [0.11, 0.37]) and effort expenditure (β = 0.54; $p < .001$ CI [0.41, 0.65]) and less negative emotions (β = -0.24; $p < .001$ CI [-0.37, -0.11]). Less negative emotions (β = -0.20; $p < .001$ CI [-0.32, -0.10]), more goal attainability evaluation (β = 0.23; $p < .001$ CI [0.11, 0.37]), and effort expenditure (β = 0.22; $p < .001$ CI [0.07, 0.36]) were associated with more goal progress. The relationship between PsyCap and the progress of the goal decreased substantially but was still significant when the three proposed mediators were accounted for (direct effect) (β = 0.30; $p < .001$ CI [0.14, 0.47]), potentially suggesting the role of other possible mediators.

A mediation analysis with goal progress as the criterion variable (Y) was carried out for also the fifth study. The results indicated that there is a positive relationship between psychological capital and subjective assessment of goal progress (total effect) (β = 0.31; $p < .001$ CI [0.17, 0.45]). The total indirect effect was significant (β = 0.13; $p = 2.03 \times 10–3$ CI [0.05, 0.22]). The indirect effect was supported for goal attainability (β = 0.11; $p = 4.34 \times 10–3$ CI [0.03, 0.20]), but not for controlled motivation (β = -5.45 × 10–3; $p = .63$ CI [-0.04, 0.01]) or autonomous motivation (β = 0.02; $p = .23$ CI [-6.85 × 10–3, 0.08]). More PsyCap was associated with more attainment expectancies (β = 0.53; $p < .001$ CI [0.37, 0.67]) and less controlled motivation (β = -0.19; $p = 7.67 \times 10–3$ CI [-0.35, -0.04]), as well as more autonomous motivation (β = 0.31; $p < .001$ CI [0.13, 0.50]). Goal attainability evaluations (β = 0.20; $p = 2.29 \times 10–3$ CI [0.04, 0.35]) were associated with more goal progress; however, controlled motivation (β = 0.03; $p = .63$ CI [-0.08, 0.14]) and autonomous motivation (β = 0.08; $p = .22$ CI [-0.03, 0.19]) were not significantly related to goal progress in this study. The relationship between PsyCap and goal progress decreased but was still significant when the three proposed mediators were accounted for (direct effect) (β = 0.18; $p = .02$ CI [0.03, 0.35]), potentially suggesting the role of other possible mediators.

Meta-analysis of conducted studies

Studies four and five provided initial support for the role of potential mechanisms in explaining the relationship between PsyCap and action crisis. However, given the numerous studies presented here, synthesizing the main findings could be valuable for future research. Following recommendations by authors like Goh et al. (2016), we conducted a mini meta-analysis (of our own studies) to synthesize these findings across our five studies. Jamovi software (The jamovi project, 2024) with the MAJOR module (1.2.3) developed by Hamilton (2018) has been used for this purpose (see Appendix D on OSF).

The analysis used the Fisher r-to-z transformed correlation coefficient. However, the transformed correlations were returned to r for ease of interpretation for the estimated average correlation. A random effect was used as the assumption that the true effect size is the same in all studies was not considered to be justifiable. Furthermore, the Knapp and Hartung adjustment was implemented due to the relatively small number of studies included in the analysis. A restricted maximum-likelihood estimator was used to estimate the amount of heterogeneity. In addition to the estimate of tau^2 (i.e., how much the true effect varies), the Q-test (i.e., heterogeneity in the true effect sizes in terms of the null hypothesis that the true effect size is identical) and the I^2 statistic (i.e., what proportion of the variance in observed effects reflects variation in true effects, rather than sampling error) are reported.

The results for PsyCap are visually depicted in Fig. 1. The analysis consisted of a total of k = 5 effects. The observed Fisher r-to-z transformed correlation coefficients were from -0.65 to -0.30. The estimated average Fisher r to z transformed correlation was = -0.49 (95% CI: -0.68 to -0.30). All the estimates are negative. The z to r back transformed the estimated average correlation coefficient = -0.45. The average result differed from zero (t(4) = -7.19, $p = .002$). The true outcomes seems to be heterogeneous (Q(4) = 24.38, $p < .001$, $tau^2 = 0.02$, $I^2 = 84.54\%$), though. A 95% prediction interval for the true outcomes is -0.94 to -0.13. Despite some heterogeneity, the results of the studies are typically in the same direction as the estimated average outcome.

The results of a meta-analytic summary of the association between the action crisis and four components are shown in Table 5. As can be seen, hope is strongest, while resilience is the weakest (but still relatively strong) correlate of an action crisis. The Bayesian multi-model linear regression results for all five studies are in the Appendix C on OSF.

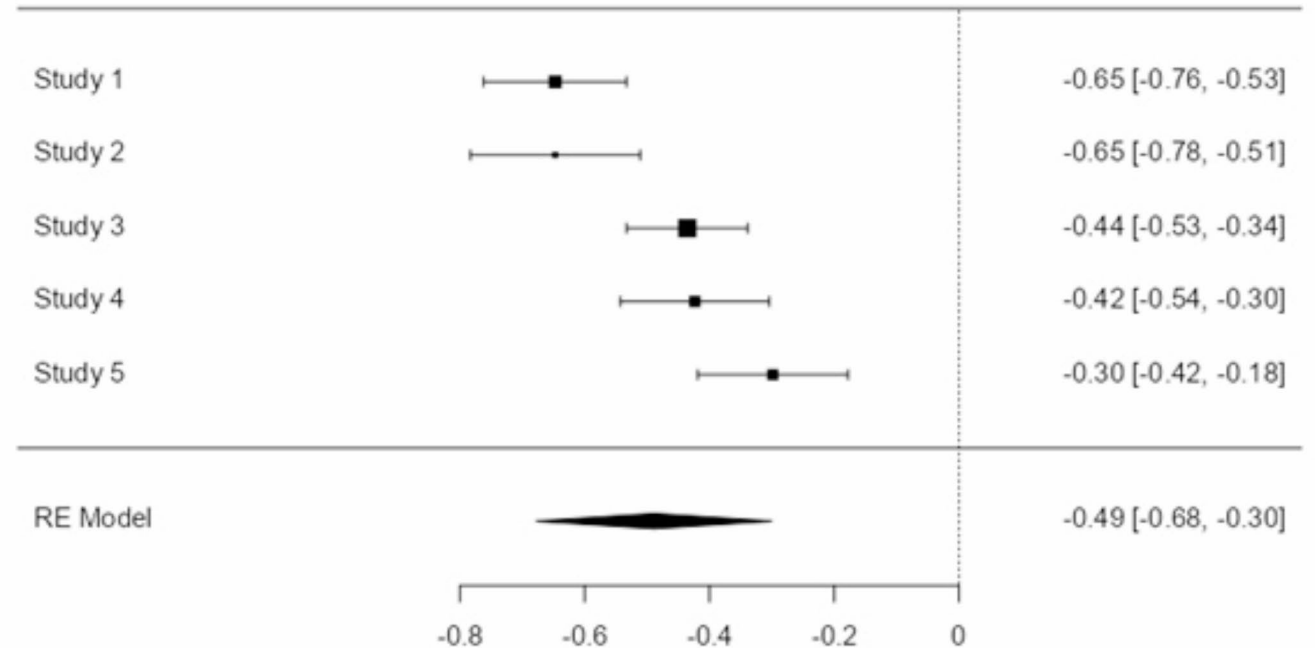

Fig. 1 Forest plot presenting a meta-analytic summary of conducted studies (Fisher r-to-z transformed correlation coefficients)

Table 5 Results of meta-analysis for four HERO components

Component	Back transformed (z to r)	Fisher r-to-z with a 95% confidence interval	Significance testing (i.e., testing the difference from a zero)	Heterogeneity Test	A 95% prediction interval for the true outcomes
Hope	-0.43	-0.46 (95% CI: -0.68 to -0.25)	Z = -6.08, $p = .004$	Q(4) = 29.75, $p < .001$, $\tau^2 = 0.03$, $I^2 = 87.69\%$	-0.95 to 0.02
Self-efficacy	-0.39	-0.41 (95% CI: -0.59 to -0.23)	Z = -6.39, $p = .003$	Q(4) = 24.23, $p < .001$, $\tau^2 = 0.02$, $I^2 = 83.14\%$	-0.82 to -0.01
Resilience	-0.34	-0.35 (95% CI: -0.45 to -0.25)	Z = -9.36, $p < .001$	Q(4) = 7.53, $p = .110$, $\tau^2 = 0.00$, $I^2 = 46.64\%$	-0.53 to -0.16
Optimism	-0.38	-0.40 (95% CI: -0.60 to -0.20)	Z = -5.61, $p = .005$	Q(4) = 26.81, $p < .001$, $\tau 2 = 0.02$, I2 = 86.11%	-0.86 to 0.05

Study 6 (Longitudinal extension)

The results of a meta-analysis of previous studies indicated that PsyCap and four HERO components are related to the action crisis. However, previous results were cross-sectional, and information concerning the mutual pattern of relations between PsyCap and action crisis across time waves was lacking. For this purpose, we employed a longitudinal study and used a Cross-Lagged Panel Model (CLPM), as well as a more recent advancement—random intercept cross-lagged panel model (RI-CLPM). In particular, Cross-Lagged Panel Models (CLPM) are used to answer questions about the prospective effect of one variable on another. This could be important in the present context as it was expected that the mean level of PsyCap predicts the mean level of action crisis later while accounting for autoregressive paths. However, these models were recently criticized as they cannot disentangle the within-person effect from the between-person variance (see, Hamaker et al., 2015). Instead, based on Hamaker et al. (2015) suggestion, the Random Intercept Cross-Lagged Panel Model (RI-CLPM) allows us to examine whether deviations from an individual's mean score of one variable (PsyCap) predict deviations from their mean score on another variable (action crisis) at a later time point after controlling for other waves (time points) and separating within-person variability from between-person differences.

Thus, in the final study, we employed the RI-CLPM model to answer the research question (Q_{10}) of whether the individual deviation from the expected level of action crisis can be predicted from prior deviation from expected scores in PsyCap while controlling structural change and vice versa. More specifically, (a) if the between-person effects

(random intercepts) are significant, it suggests that individuals with higher levels of Psychological Capital (PsyCap) tend to experience lower levels of action crises consistently across all time points, regardless of their within-person fluctuations. This reflects stable, trait-like differences between individuals. In contrast, if (b) the within-person effect is significant, it indicates that, after controlling for stable differences between people, fluctuations in PsyCap within an individual over time predict corresponding fluctuations in their action crises. This captures the dynamic, process-oriented aspect of how changes in one variable relate to changes in another within the same individual.

Method

Sample

A total of ($N = 254$) was analyzed,[9] 89% were female ($M_{age} = 21$, Median = 21.00, Mode = 20.00, SD = 1.69). Convenience sampling and a longitudinal design were used.

Procedure

In this study, we were interested in a more specific goal. Participants listed a grade they would like to obtain in a selected course during their studies (e.g., an A grade)—and their rated selected goal dimensions, including the action crisis, three times during the semester. Time points were T_1 a few weeks after the beginning of the semester (end of September/beginning of October), T_2 at the middle of the semester (middle of November), and T_3 at the end of the semester but before exams (end of December). There was also follow-up data collection after the exams (mid-February), but this was not of interest in the present study.

Instruments

Psychological capital and *action crisis* were operationalized similarly as in the previous studies. The internal consistency was McDonalds $\omega = 0.90$, $\omega = 0.90$, and $\omega = 0.92$ for CPC-12R and McDonalds $\omega = 0.71$, 0.74, and 0.76 for ACRISS at T_1, T_2 and T_3, respectively. Other variables were also collected but are not of interest here.

[9] Minimal sample size and stopping rule were similar to those in the previous study. However, please note that the number of participants varied slightly from wave to wave and that RI-CLPM are more complex models. After the third assessment and the attention check were applied (control question where participants should mark the specific value as a control if they read instructions and items properly), the final sample size decreased. Thus, 'full information' maximum likelihood estimation has been employed to compensate for this.

Analysis

As mentioned, Cross-Lagged Panel Models (CLPM) have traditionally been widely used to examine bidirectional relationships. However, Hamaker et al. (2015) criticized the traditional model and suggested that Random-Intercept Cross-Lagged Panel Models (RI-CLPM) should be implemented instaed. The benefits of RI-CLPM lie in the ability to differentiate between-person stability and within-person change. We computed both models but focused our attention mainly on the results of the RI-CLPM model. The analysis was conducted in the R and lavaan package (Rosseel, 2012).

Results

In the following analysis, we fitted the classical CLPM model and more advanced RI-CLPM (see Appendix E on OSF).

First, we examined the classical Cross-Lagged panel model (CLPM). The chi-square test of model fit was significant, indicating that the model does not fit the data well ($\chi^2(4) = 51.412$, $p < .001$). Also, fit indices, especially RMSEA, were above the recommended range (CFI = 0.91, RMSEA = 0.30, 90% CI [0.23, 0.37], SRMR = 0.06). The autoregressive paths for psychological capital (T_2 on T_1: $\beta = 0.74$, $p < .001$; T_3 on T_2: $\beta = 0.76$, $p < .001$) and action crisis (T_2 on T_1: $\beta = 0.55$, $p < .001$; T_3 on T_2: $\beta = 0.64$, $p < .001$) were significant ($p < .05$), indicating potential stability in psychological capital and action crisis over time. The cross-lagged paths from psychological capital to action crisis and vice versa were not significant at the 0.05 level, indicating stability in both psychological capital and action crisis over time, with some evidence of a potential unidirectional influence from psychological capital at T_2 to action crisis at T_3. There was a significant covariance at the first-time point (= -0.26, $p < .001$), suggesting a relationship at time 1 and variability in psychological capital and action crisis across individuals (as indicated by the variances of the latent variables that are significantly different from zero; $p < .05$). However, the results indicated that the CLPM model had a bad fit. Also, as discussed, CLPM can confound the between-person and within-person effects and bias the conclusions about within-person effects. As such, RI-CLPM is theoretically superior as it accounts for between-person variance.

Therefore, next, we examine the Random Intercept Cross-Lagged model (RI-CLPM). A chi-squared difference test was conducted to compare the two models. The results indicated a significant difference between models ($\Delta X\ (3) = 51.411$, $p < .001$), with the RI-CLPM showing a better fit to the data, as also evidenced by lower AIC, BIC, and RMSEA.

The chi-square test of model fit of RI-CLPM was non-significant, indicating that the model fits the data well (χ^2 (15) = 0.001, p = .971). The fit indices were also excellent (CFI = 1.00, RMSEA = 0.01, 90% CI [0.01, 0.01], SRMR = 0.01), but may indicate potential overfitting. At the *between-person level*, there was a significant negative covariance between kappa (representing average levels of PsyCap) and omega (representing average levels of action crisis) (β = -0.38, p < .001), indicating that individuals with higher average PsyCap tend to experience lower average action crisis over time. The significant variances for kappa (0.61, p < .001) and omega (0.49, p < .001) suggest individual differences in these constructs. At the *within-person level*, after accounting for between-person variability, there were no significant cross-lagged effects between PsyCap and action crisis (all p > .05). This finding implies that within individuals, changes in PsyCap do not predict subsequent changes in action crisis over time and vice versa when between-person variability is accounted for. However, this does not necessarily indicate independence between these constructs over time; it may reflect that any potential effects are too small to detect with this study's sample size or model specification. The observed effects could be characterized as small to medium, as suggested by Orth et al. (2022), and may vary across time points. Future research may explore alternative model specifications or measurement intervals to investigate these relationships further.

We also aimed to conduct a longitudinal mediation analysis based on RI-CLPM; however, due to complexity and limited sample size, the models did not converge.

Brief discussion

In the longitudinal study, significant differences between effects indicated that individuals higher in PsyCap tend to have lower levels of action crisis across all time points, regardless of their fluctuations within a person, as shown by the between-person effect in the Random Intercept Random Intercept Cross-Lagged model. A nonsignificant within-factor effect indicates that after controlling for between-person differences, changes in PsyCap do not predict changes in action crisis within individuals in time given present statistical power. We also aimed to conduct a longitudinal mediation analysis based on RI-CLPM; however, due to complexity and limited sample size, the models did not converge. Thus, we reserve an examination of potential mediators identified in the present study for future studies and move to the general discussion.

General discussion

An action crisis occurs when individuals face the internal conflict between continuing to pursue a goal or stopping the pursuit due to problems encountered during goal striving. Despite recent research on action crises and identification of some promising candidates (such as mindfulness; Marion-Jetten et al., 2022), little is known about cultivable protective factors that can prevent action crises from occurring or mitigate the action crisis experience. In the present set of studies, we focused on one such potential factor—psychological capital (PsyCap). In the set of six studies, we were interested in whether 'HERO' within (i.e., psychological capital and its components) can shield us from the development of a crisis. We were also interested in replicating and extending the nomological network of potential mechanisms that can help us better understand how the effect of PsyCap on the action crisis potentially unfolds.

As hypothesized, PsyCap was negatively associated with the experience of an action crisis (i.e., the more PsyCap individuals possess, the less crisis they experience in their goal pursuit, and vice versa). This pattern of results was found to be relatively robust irrespective of the study (Study 1 to 6), language/culture (Hebrew vs. Slovak), and operationalization of PsyCap (PCQ vs. CPC), among other factors. Moreover, the link was present even when demographics and selected personality traits were accounted for. This is a potentially important finding as several studies indicated that action crisis is related to goal disengagement (Herrmann & Brandstätter, 2015) and deterioration of well-being and mental health (Brandstätter et al., 2013; Herrmann & Brandstätter, 2013; Holding et al., 2017, 2021; but note that goal disengagement could be adaptive in some cases as discussed below).

These findings converge with previous results on the action crisis and extend them in several ways. First, they build on emerging research that examines risk and protective factors that can shield an individual from the experience of an action crisis (see, e.g., Herrmann et al., 2014; Herrmann & Brandstätter, 2013; Holding et al., 2017; Wolf et al., 2018); but purposefully focus on an integrative (Luthans & Youssef-Morgan, 2017) and cultivable (Lupșa et al., 2020; Salanova & Ortega-Maldonado, 2019) construct that combines four interrelated variables from positive psychology – PsyCap.

In line with our results, Wolf et al. (2018) found that action orientation and generalized self-efficacy (particularly their shared variance) reduce the development of an action crisis over the course of a semester. The present set of studies indicates that not only self-efficacy but also a conceptually broader construct of PsyCap and its four hero components is cross-sectionally associated with a lower degree of

experience of an action crisis. As mentioned above, PsyCap incorporates four variables from positive psychology that share conceptual similarities—hope, self-efficacy, optimism, and resilience. Thus, using the PsyCap framework allowed us to examine the parsimonious and possibly synergic effect of these variables in terms of agentic goal pursuit, a sense of control, and intentionality, as well as the specific role of each component – optimism, hope, self-efficacy, and resilience. To the best of our knowledge, this is the first time that these constructs have been systematically studied in the context of an action crisis, except for self-efficacy.

Wolf et al. (2018) noted that the relationship between self-efficacy and action crisis could be indirect and mediated through autonomous motivation. However, this does not mean autonomous motivation is the only potentially important mediator in this context. In particular, given that cognitive appraisals have been suggested as a potential mechanism explaining the role of PsyCap in various outcomes in previous studies (Youssef-Morgan & Luthans, 2013), and given the previously established role of goal attainability in action crises in various contexts (Brandstätter & Herrmann, 2016; Brandstätter et al., 2013; Ghassemi et al., 2017), we also hypothesized the indirect role of goal attainability.

As hypothesized, goal attainability (but not goal desirability) explained the shared variance between PsyCap and action crisis in several studies (Study 2, Study 4, and Study 5). This makes sense considering the nature of PsyCap—the more individuals have the confidence to put in the necessary effort to succeed (self-efficacy), the greater the positive attribution they make about the future (optimism), the more they persevere towards goals, the more they can redirect the pathways when necessary (hope), and bounce back when problems strike (resilience), the more they consider the goal at hand as attainable. Next, the more people considered the goal attainable, the less crisis they experienced during goal-striving (Brandstätter & Herrmann, 2016; Brandstätter et al., 2013; Ghassemi et al., 2017). This aligns with the Conservation of Resources Theory (Hobfoll, 2011; Hobfoll et al., 2018) and the Dual process theory of Accommodation and Assimilation (Rothermund & Brandtstädter, 2021).

However, Study 2 also indicated that the relationship between PsyCap and action crisis is present even when goal attainability is accounted for. This indicated the existence of other possible mechanisms besides cognitive appraisals. Therefore, additional candidates for mediators were examined in Study 4 and Study 5, namely negative emotions related to goals, autonomous and controlled motivation, and effort expenditure. This decision was based on the notion stemming from PsyCap literature suggesting that, besides cognitive appraisals, emotions and agentic conations are suggested as processes that explain the effect of PsyCap on other variables (Youssef-Morgan & Luthans, 2013). Furthermore, previous studies found a link between PsyCap and motivation (Datu et al., 2018; Liu & Huang, 2022). The results from Studies 4 and 5 provided initial support for hypothesized indirect effects. This was true for negative goal-related emotions, effort expenditures, and controlled motivation. Additionally, these findings partially generalized to goal progress as a criterion variable. For goal progress, significant indirect effects were found for goal attainability, negative goal-related emotions, and effort expenditure. This finding aligns with Monzani et al.'s (2015) finding that dispositional optimism was related to goal progress and commitment via expectancy changes, but it also suggests other potential mechanisms that can be of interest in future studies.

So far, PsyCap has been discussed instead of its four 'HERO' components. In fact, the main merit of this approach is that it parsimoniously integrates four interrelated variables that were historically developed independently but share conceptual similarities and variance. However, some authors suggest that analyzing the individual components could also be important. For example, Dawkins et al., (2013) stressed the importance of incorporating the analysis of four components for theoretical advancement. Moreover, Rand (2018) discussed the potential differences between optimism, hope, and self-efficacy in terms of perceived ability and intention, self-focus, and generalizability.

Across five studies, all four components of PsyCap were strongly and negatively related to action crises (with meta-analytic summary for = -0.43 for hope, -0.39 for self-efficacy, -0.38 for optimism, and -0.34 for resilience). According to Funder and Ozer (2019), this is a large to very large effect under the assumption that the effect accumulates over time and estimates are reliable. Although all four components showed relatively similar levels of association with action crisis, linear regression results favored models with hope as a potentially most important predictor. Thus, it appears that when the four components of'HERO' are considered, it is especially'H' (hope) that protects us from experiencing an action crisis. This is not surprising given that hope is most strongly related to goal striving, and when an individual has goal-related energy (i.e., agency) and knows how to attain the goal (i.e., pathways), obstacles should occur less likely and will have a lesser impact. It should be noted, however, that these findings were not fully consistent across studies, and optimism and self-efficacy were also potentially important in some contexts (see Appendix C on OSF dedicated to the Bayesian linear regression and model averaging for linear regression models). Resilience was favored to a lesser degree, but it could be more important in later phases when an individual attempts to cope with an action crisis over time and encounters more severe setbacks. However, these

assumptions and findings should be further examined in future research.

How can the present findings be integrated into a general theoretical framework for goal-striving? Based on present and previous studies, the role of PsyCap in action crisis can be pondered in the broader context of the Rubicon Model of Action Phases and Mindset Theory (see, e.g., Gollwitzer & Keller, 2016; Keller et al., 2019; but also Marion-Jetten et al., 2022 for a similar line of reasoning in the context of mindfulness). According to this model, the desirability and feasibility of the goals are evaluated before a decision is made, i.e., in the pre-decision phase. After the Rubicon is crossed, feasibility and desirability concerns are no longer important in an action phase. However, it has been shown that an action crisis can lead to mindset regression and reevaluation of goal attainability (Brandstätter & Schüler, 2013; Herrmann et al., 2014). Thus, due to its positive, intentional, and goal-oriented nature (Luthans & Youssef-Morgan, 2017), it can be reasoned that PsyCap facilitates feasibility expectations in the pre-actional and, later, during an actional phase, shields an individual from developing severe action crises. Also, PsyCap can facilitate selecting more autonomous/less controlled goals. Moreover, in previous research, it has been shown that PsyCap contributes to attainment of more autonomous goals (Datu et al., 2018; Liu & Huang, 2022), and autonomous/control motivation can serve as a protective/risk factor of action crisis development (see, e.g., Holding et al., 2017, 2021; Herrmann et al., 2014; Herrmann & Brandstätter, 2013; Marion-Jetten et al., 2022; Wolf et al., 2019). Controlled but not autonomous motivation has been supported as a potential mediator in the present research, but this does not mean that autonomous motivation would not be important while pursuing other goals. Third, in a post-decisional phase, where actions are planned, the goal-orientated nature of PsyCap can facilitate the planning of sub-steps and later higher effort expenditure even when faced with obstacles, as an individual expects that he/she can overcome obstacles and does not feel paralyzed. Furthermore, when setbacks occur, they could be evaluated as less detrimental. Fourth, PsyCap was linked to stress, well-being, and positive/negative affect (Lorenz et al., 2016; Luthans & Youssef-Morgan, 2017). Thus, it can be hypothesised that it could lead to decreased negative affect during the action phase of goal striving. However, although theoretically plausible and based on observation from this study, these mechanisms should be further corroborated in future studies to provide more definitive answers.

The present results have important practical implications. For instance, emerging literature has shown that it is possible to cultivate psychological capital due to its state-like nature in various contexts (see, e.g., Dello Russo & Stoykova, 2015; Luthans et al., 2006a, b), while the present set of studies indicates that this could be of potential importance in goal striving and especially action crisis-related context. Particularly in areas where an action crisis is likely to occur, such as education, work, or sports, the systematic development of'HERO' within individuals could be beneficial. As documented by a literature review (Salanova & Ortega-Maldonado, 2019) and a meta-analysis (Lupșa et al., 2020), various interventions could cultivate PsyCap and its components. Accordingly, a PsyCap intervention (PCI) (Luthans et al., 2006a; Russo & Stoykova, 2015) could be recommended for PsyCap, while stress management and positive psychology interventions could be recommended for cultivating specific components, such as self-efficacy. However, examination of the effectiveness of these interventions in the context of action crisis development is reserved for future studies.

As Studies one to five were cross-sectional, the sixth study focused on the mutual relationships between PsyCap and action crisis over time. The cross-lagged panel model initially indicated that PsyCap predicts action crisis later, but these models are often civilized as they cannot disentangle within-person effect from a between-person variance. Thus, we employed more complex random intercept, cross-lagged panel models. The results indicated that the average level of PsyCap across time points is negatively associated with the average level of action crisis across time points as indicated by examination of between-person effect, but causal effects of PsyCap on action crisis (and vice versa) within individuals over time was not supported. Nevertheless, different contexts, more time points, and a bigger sample (with higher statistical power) should be used to falsify the idea that PsyCap and the action crisis are related at the change level. Furthermore, as we could not run a more complex RI-CLPM, examining the mediation effect longitudinally is reserved for future research.

As alluded to, the present set of studies has some limitations. First and foremost, the present studies did not allow us to establish causality, as the shared variance among variables does not speak to causation. The terminology (predictors, criterion variables, mediators) was based on the proposed implicit conceptual model rather than true causality. Although longitudinal data were also used, and the conceptual model seems logically plausible and in line with theory, future research should use more intensive longitudinal designs and corroborate causality through systematic experimental manipulation (see, e.g., Bullock & Green, 2021; Pirlott & MacKinnon, 2016). Similarly, it is worth considering the overlap of PsyCap with variables such as positive affect and other theoretically potential variables (such as action orientation, as suggested by the reviewer). In fact, as recommended by Dawkins et al., (2013) in their critical review, a further thorough examination of

discriminant and convergent validity should be conducted with respect to PsyCap. Furthermore, structural equation modeling (SEM) with latent variables should be used in future studies to account for the measurement error in more complex structural equation models. However, (a) the question of whether the formative or reflective model should be implemented regarding PsyCap and Action crisis is still open, and (b) SEM is a method that needs a bigger sample size. Thus, a more simplistic approach (e.g., correlation and regression analysis) was deemed more suitable in this initial research step, and a more complex SEM analysis is reserved for future research. Also, objective criteria could be used in future research. For example, cortisol levels could be examined as a correlate of action crisis, as has been done in several previous studies (Brandstätter et al., 2013; Holding et al., 2021). Moreover, many people in the analyzed samples, but also in other studies dedicated to action crises, did not experience serious crises, and focusing on people who experience crisis with more person-centered approaches could bring new insights. Although academic goals and/or goals of students have been widely studied in the context of action crisis previously (see, e.g., Brandstätter & Herrmann, 2016; Brandstätter & Schüler, 2013; Ghassemi et al., 2017; Herrmann & Brandstätter, 2013, 2015; Holding et al., 2017) and we are not aware of any limitations in generalization beyond this type of goal, additional types of goals such as those related to health or sport could be examined in future research. This would provide further evidence regarding the potential moderators. Moreover, as most of the sample in the present study were students with academic goals, other types of goals in various life-span phases could be examined in future research, as this posits additional potential limitations on the generalizability of findings.

Last but not least, the present set of studies was conducted with the assumption that it is beneficial to identify factors that can protect individuals from developing an action crisis or help them overcome an action crisis. Persistence is not only adaptive but, in some cases, also necessary when attaining long-term goals (Brandstätter & Bernecker, 2022). However, as echoed several times throughout the manuscript, an action crisis is not inherently negative, as it can facilitate disengagement from problematic goals (Brandstätter & Herrmann, 2016). In fact, accommodation self-regulatory strategy (Rothermund & Brandtstädter, 2021) could be beneficial in some contexts as letting go of futile goals can contribute to the well-being of an individual in the long run (Wrosch et al., 2013, Wrosh & Scheier, 2020). Therefore, examining the potential negative effects of overconfidence and toxic positivity is also worth examining.

Conclusion

The present set of studies has provided initial support for the role of psychological capital (PsyCap)—as a construct that integrates (H)ope, s(E)lf-efficacy, (R)esilience, and (O)ptimism (i.e., HERO)—in the experience of an action crisis. Across several studies, it was found and sequentially replicated that 'HERO' within is linked with (and potentially protects us from) the experience of an action crisis. In particular, it has been shown that the more PsyCap individuals possess, the less crisis they experience in their goal striving (Study 1 to 6), and this is true even when different operationalisation of PsyCap is used and when demographics (age and gender) and selected personality traits (negative emotionality and conscientiousness) are accounted for (Study 2 and 3). Furthermore, it was found that subjective assessment of goal attainability (but not desirability) can serve as an indirect effect in the relationship between PsyCap and action crisis (Study 2, 4, and 5) and that goals-related emotions, controlled motivation, and effort expenditure could also play a similar role (Study 4 and 5). However, it was also found that in contrast to the between-subject effect that was supported, the effect within the subject (i.e., the cross-lagged effect of PsyCap on action crisis when accounted for between-subject effect) was not supported (Study 6).

Authors' contribution Pavol Kačmár: Conceptualization, Methodology, Formal analysis, Writing—Original Draft. Hadyeh Falah and Noa Rachel Versolker: Methodology, Data collection for studies 1 and 2, respectively, Writing—Review & Editing.

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Data availability The data that support this study's findings, computation scripts, results, research materials, and appendices are available at the Open Science Framework (OSF): https://osf.io/jukxb/?view_only=671805e1573e4eb9b186c16a5b064e01.

Declarations

Transparency Studies one and two were conducted as co-authors' final theses. Studies three to six were conducted in our lab as part of bigger data collections dedicated to goal striving. We are thankful to the team under the supervision of J.B. for help with data collection for studies three, four, and six and M. K., who helped with the data collection for study five. The results presented in the manuscript was reserved solely for this publication and are not presented elsewhere.

Conflict of interest The authors declare that they have no conflict of interest.

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