



Searching for the HERO in Youth: Does Psychological Capital (PsyCap) Predict Mental Health Symptoms and Subjective Wellbeing in Australian School-Aged Children and Adolescents?

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Published online: 14 July 2020

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Abstract

Psychological capital (PsyCap) comprising the positive psychological resources of hope, efficacy, resilience, and optimism (HERO) has strong empirical associations with increased wellbeing and reduced mental health symptoms in adult samples. Emerging studies of PsyCap among school-age students have also shown preliminary, positive associations between PsyCap and student wellbeing. The present study is the first to examine PsyCap-HERO constructs and associations with both mental health symptoms and subjective wellbeing in school-aged children and adolescents (aged 9–14 years). A convenience sample of Australian school students (N = 456, Mage = 11.54, SD = 1.20, 47% female) completed an online survey during class time. Measures of hope, efficacy, resilience, optimism, flourishing, anxiety, and depression previously well-validated in school samples were used. Significant associations between each HERO construct and flourishing, anxiety and depression symptoms in the expected direction were found, and importantly, the combination of HERO constructs was shown to be a stronger predictor of increased levels of student flourishing, and decreased levels of anxiety and depression symptoms, than individual HERO constructs. Findings indicate that student PsyCap may be a promising area of further investigation for schools, policymakers, clinicians and researchers looking to identify positive psychological resources in youth that may buffer poor mental health and promote wellbeing.

Keywords Psychological capital · PsyCap-HERO · Flourishing · Anxiety · Depression · Wellbeing · School · Children and adolescents

Introduction

Youth mental health, wellbeing and the school context are inextricably intertwined. Mental disorders affect 10–20% of children and adolescents worldwide [1], making them among the most prevalent and debilitating health conditions affecting children and adolescents today. Epidemiological research indicates approximately half of all mental health problems develop before the age of 14, with anxiety disorders having the earliest age-of-onset across a number of countries and diverse cultures [2]. Early onset anxiety is

often a precursor to co-morbid anxiety disorders, mood, or substance disorders [2], highlighting the need for better detection and early intervention.

Schools can play a major role in supporting children and adolescents with mental health problems and are often where emotional and behavioural issues are first identified [3]. A recent large survey of Australian child and adolescent mental health and educational outcomes (N = 6310; [4]) found that students with mental disorders perform poorer on national standardised assessments of literacy and numeracy, have lower levels of school connectedness and academic engagement, and have higher rates of school absenteeism [4]. Of note, these academic discrepancies were found to occur across all year groups, and moreover, gaps in academic achievement were found to increase year on year for those youth experiencing mental health problems. The authors concluded that, ‘improving the mental health and wellbeing of students at the population level is likely to be one of the most

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important prerequisites to improving the academic performance of Australian students' [4]. Despite this directive, the challenge of identifying mechanisms that might buffer mental health problems and promote wellbeing in young people remains a significant one for clinicians, researchers, educators, and policymakers [5, 6]. One set of psychological resources that has demonstrated strong evidence in influencing mental health, vocational performance and wellbeing outcomes for adults is psychological capital (PsyCap).

Conceptualised by Luthans et al. [7], PsyCap was developed under the framework of Positive Organisational Behaviour (POB) and defined as "the study and application of positively oriented human resources strengths and psychological capacities that can be measured, developed and effectively managed for performance improvement in today's workplace" [8]. PsyCap currently comprises a set of four constructs: hope, efficacy, resilience and optimism; which is commonly ascribed the acronym HERO [9]. The theoretical underpinnings of PsyCap are rooted in positive psychology and stress research. More specifically, PsyCap adopts Fredrickson's broaden-and-build theory, which asserts that the experience and awareness of positive emotions broadens an individual's thought-action repository, from which psychological resources are built [10]. Furthermore, PsyCap also draws upon Hobfoll's (2002) conservation of resources theory, which posits that certain psychological resources cluster to form 'resource caravans' [11]. These caravans travel together and work in a synergistic manner producing 'differentiated manifestations over time and across contexts' [12]. A 2011 meta-analysis of workplace PsyCap studies ($N = 12,567$) indicated, among other outcomes, significant associations between PsyCap and increased levels of job satisfaction, and psychological wellbeing, and decreased levels of stress and anxiety [13]. Convergent and discriminant validity of the HERO constructs have been empirically established in PsyCap workplace studies [12, 14] and within the general literature (e.g., [15–17]).

PsyCap theory remains largely under-studied among youth samples and the studies that have been conducted to date have been hampered by methodological problems. There are significant applied benefits in demonstrating predictive validity of HERO constructs proposed in PsyCap theory in youth in terms of informing prevention and early intervention science, and potential application in educational contexts, which represent developmental equivalent of workplaces in which PsyCap theory has primarily been developed and tested. Moreover, the study and application of positively oriented strengths and capacities, aligns with goals of schools in which there is a significant focus on strengths-based approaches to student wellbeing [18–20].

Research on PsyCap in School-Age Youth

A review of the literature revealed only five empirical studies to date that have examined PsyCap, conceptualised as hope, efficacy, resilience, and optimism, among school-age youth [21–25]. Cumulative findings of these studies include support for significant associations between hope, efficacy, resilience and optimism, as well as associations between combined HERO constructs and both desirable and undesirable outcomes. For example, one study examining predictive utility of HERO constructs (individually and combined) and the emotional and subjective wellbeing of Pakistani adolescents ($N = 616$, $\text{Mage} = 15.53$, $\text{SD} = 1.12$) found that individual HERO constructs and combined HERO (as PsyCap) were significantly and positively correlated with each other, with positive affect, and subjective wellbeing; and significantly negatively correlated with negative affect [21]. Further, multiple regression analyses indicated PsyCap significantly predicted negative affect (negative association), positive affect (positive association), as well as subjective wellbeing. Self-efficacy was not a significant unique predictor however of subjective wellbeing or positive emotion, and moreover, hope and resilience were not significant unique predictors of negative affect [21]. Datu et al. (2016) investigated the relationship between PsyCap (as a latent variable comprising observed variables of HERO), wellbeing and academic outcomes, in three studies published as two papers, [24, 25] using two Filipino high school student samples. The first study [$N = 606$, 305 female, 300 male, 1 unknown gender, $\text{Mage} = 13.87$, $\text{SD} = 1.26$; [25] tested a measurement model with PsyCap as the predictor variable and academic engagement, flourishing, interdependent happiness, and positive affect as outcome variables. The model showed good fit indices, and all pathways were significant in the hypothesised direction [25]. The second study [$N = 606$, 305 female, 300 male, 1 unknown gender, $\text{Mage} = 13.87$; [24] found that PsyCap positively predicted autonomous motivation and controlled motivation and negatively predicted amotivation. The third study [$N = 384$, $\text{Mage} = 14.34$, $\text{SD} = 1.47$; [24] corroborated the finding from the second study, with PsyCap predicting academic motivation cross-sectionally, as well as longitudinally (2 months later). PsyCap was also found to predict concurrent and future academic engagement, achievement and amotivation; moreover, PsyCap at Time 1 predicted PsyCap at Time 2 indicating the relative stability of PsyCap over time. A study of Chilean high school students aged 14–17 years old ($N = 639$, 51% female; [23]) explored PsyCap (as a latent variable comprising HERO) as a mediator between study-related positive emotions and academic performance, and found adequate fit indices for the proposed model with

PsyCap mediating the relationship between study-related positive emotions and academic performance. These studies conducted across cultures and countries, using different methodological approaches and statistical analyses, have collectively revealed initial support for associations between the individual HERO constructs and combined HERO as PsyCap, and a range of desirable (e.g., positive affect, flourishing) and undesirable (e.g., negative affect) outcomes in school samples. However, the findings to date are limited by several methodological shortcomings.

A key limitation applicable to all studies to date is the absence of an empirically sound measure of youth PsyCap, or utilisation of reliable and validated measures of hope, efficacy, resilience and optimism suitable for student samples. Measures used in these studies comprised either an unpublished, non-validated scale devised by the authors [21] or a version of the Psychological Capital Questionnaire [26] adapted from workplace setting to schools [24, 25, 27] with limited details on the modification of the scale for youth, or insufficient details regarding psychometric properties. Numerous studies have shown that age-related downward extensions of adult scales are fraught with problems, not least because they do not accurately reflect the developmental nuances of the sample (e.g., [28, 29]). Further, only two of the five studies to date examined the associations between the individual HERO constructs [21, 23], and of these, only one study to date has reported on the predictive utility of the individual HERO constructs on negative student outcomes (i.e., negative affect; [21]). In addition to methodological problems, it remains unclear whether combined HERO constructs are better than individual HERO constructs in predicting youth positive and negative wellbeing.

Research on Hope, Efficacy, Resilience and Optimism in School-Age Youth

Because PsyCap theory and the *combined* effects of HERO constructs on psychological outcomes has to date received scant empirical attention among youth samples in quality conducted studies, it is important to consider the literature on the *individual* constructs of hope, efficacy, resilience and optimism in predicting mental health, wellbeing and academic outcomes in school-age youth. This is important because it provides a solid conceptual and empirical basis to support the hypothesis that a combined PsyCap construct will be a better predictor of outcomes than individual measures alone.

Hope

Children's hope has been defined as 'a cognitive set involving the beliefs in one's capabilities to produce workable routes to goals (the pathways component), as well as the

self-related beliefs about initiating and sustaining movement toward those goals (the agency component'; [30]). In school samples, using the Children's Hope Scale [30], hope has been shown to be predictive of both positive and negative affect, student life satisfaction and wellbeing. For example, Ciarrochi et al. (2015) conducted a longitudinal study of Australian students (N=975) over 6 years of high school, from Grade 7 (Mage = 12.41, SD = .53) to Grade 12 (Mage = 17.37, SD = 0.50). Their study indicated that hope was an antecedent to positive affect, predicted changes in positive affect, and this effect was uni-directional. By contrast, hope and negative affective states had a bi-directional association across time [31]. A longitudinal study of US school students aged 10–18 (N = 860, Mage = 13.74, SD = 1.81 at Time 1, N = 699, Mage = 14.78, SD = 1.82 at Time 2) has also shown hope as a relatively stable construct over time; predictive of student life satisfaction and internalising behaviours; and a moderator between life satisfaction and internalising behaviours [32]. Moreover, hope has also been found to be a significant predictor of depression and mediator between maladaptive perfectionism and depression in a study of US middle school students aged 11–15 (N = 153, 93 female, 50 male, Mage = 12.9; [33]).

Efficacy

Defined as 'the conviction that one can successfully execute the behaviour required to produce the outcomes' [34]; self-efficacy refers to an individual's belief in their ability to produce a desired action [35]. These self-beliefs are discernable to domains of functioning (e.g., social efficacy, academic efficacy; [36]) and derive from four sources: (1) mastery experiences, (2) social modelling, (3) social persuasion and (4) choice processes [37]. In an Italian school study of 11–14 year olds (N = 279, Mage = 12), academic self-efficacy was found to be linked to academic achievement; both directly and through its influence on academic aspirations, pro-social behaviour and lowering proneness to depression. Further, self-regulatory efficacy was found to contribute to academic achievement and reduced problem behaviour, whereas social efficacy had no direct impact on academic achievement, but had indirect effects by increasing academic aspiration and reducing vulnerability to depression [38]. In a study of Australian school students aged 11–18 year olds (N = 935, Mage = 14.40, SD = 1.43), academic self-efficacy related to academic aspirations and delinquency, and directly related to academic achievement. Further, there was also a significant indirect effect of academic self-efficacy on achievement via delinquency; self-regulatory self-efficacy was negatively related to delinquency and positive related to academic achievement; and a significant indirect effect of self-regulatory self-efficacy was found on achievement via delinquency [36]. Collectively, these studies provide strong

support for the role of self-efficacy in improving a host of student outcomes.

Resilience

Referring to ‘the class of phenomena characterised by good outcomes in spite of serious threat to adaptation or development’ [39], resilience research has a rich and long history in developmental psychology, child psychopathology and positive youth development. Early pioneers of resilience research of the 1950s and 1960s (e.g., Garmezy, Gottesman, Rutter) set out to discern the etiology of conditions such as schizophrenia or autism, as well as the ramifications of threats to development (e.g., trauma) recognising the significance of developmental pathways characterised by positive adaptation after adversity, and introducing diathesis-stress models of mental illness [40]. Proposed theories of genetic and psychosocial factors of risk, vulnerability and protection, preceded research seeking to measure resilience and identify correlates of resilience in children, family, relationships, or environment. This progression, meeting the advancement of technology to enable multi-level analyses, enabled the investigation of resilience as a developmental systems concept; incorporating the domains in which individual development is ingrained, i.e., families or schools [40, 41]. One widely accepted approach to the study of resilience in children and youth draws upon social ecological models [41, 42]. Influenced by Bronfenbrenner’s ecological systems theory of human development [43]; the social ecological model of resilience emphasises the importance of interactions between children and their environmental systems (e.g., family, peer groups, schools), in turn integrated into other systems (e.g., communities, cultures) as pivotal to the development of resilience [41]. Within adolescent school samples, resilience operationalised within a social ecological model has been shown to predict depression, anxiety, stress, and obsessive–compulsive symptoms ($N = 307$, $Mage = 16.4$, $SD = 0.7$, 54% male; [44]). Furthermore, resilience has also been found to predict friendship quality, self-esteem and general self-efficacy among children and youth ($N = 409$, $Mage = 14.77$, $SD = 2.14$, 160 males; [45]).

Optimism

Optimism is defined as ‘generalised expectancy for favourable outcomes’ [46]. Studies with school-aged samples of youth have shown optimism to be a predictor of academic achievement (e.g., [47]), school drop-out (e.g., [48]), depressive symptoms (e.g., [49]) and emotional wellbeing (e.g., [50]). In a recent meta-analysis of predictors of hope in adolescents, optimism was found to be one of eleven of the most common reported predictors [51] providing support for associations among positive psychological

resources. Yet relatively little is known about the developmental determinants of optimism [52, 53]. A Danish retrospective study ($N = 8673$) however found that school performance at age 14 statistically significantly predicted dispositional optimism at age 31 in both men and women [52].

Taken together, constructs of hope, efficacy, resilience and optimism have been widely studied in adults and found to be predictive of performance, job satisfaction, wellbeing, stress and anxiety [12, 13] as a combined construct, referred to as psychological capital (PsyCap). Studies with youth are limited and hampered by methodological problems and have not yet examined whether the combined construct is superior to individual constructs in predicting positive and negative measures of wellbeing and mental health. Addressing this gap is important for demonstrating utility of PsyCap theory earlier in the lifespan and potential applicability in contexts such as educational and school settings which offer unique opportunities to enhance psychological resources at the population level.

The Current Study

The aim of the current study was to explore the interrelationships between hope, efficacy, resilience and optimism and their associations (both individually, and collectively) with mental health symptoms and subjective wellbeing in Australian school students aged 9–14 years. In addressing the limitations of existing youth PsyCap studies and testing the combined HERO constructs, this study extends upon prior studies by utilising empirically-validated measures for hope, self-efficacy, resilience and optimism, specifically developed for use with children and adolescents. Moreover, combining hope, efficacy, resilience and optimism, this study cross-sectionally tests the predictive utility of PsyCap on measures of student subjective wellbeing (i.e., flourishing), and mental health outcomes (i.e., symptoms of anxiety and depression). Specifically, the following hypotheses are evaluated:

H1 The four individual constructs of HERO (i.e., hope, efficacy, resilience and optimism) will be significantly, positively correlated with each other, and flourishing;

H2 The four individual constructs of HERO will be significantly, negatively correlated with anxiety and depression;

H3 PsyCap (comprising combined HERO constructs) will:

- (a) Significantly predict increased student subjective flourishing;
- (b) Significantly predict decreased student self-reported anxiety and depression; and

- (c) Have greater predictive power (i.e., account for more variance in outcomes) than the individual HERO constructs.

Method

Participants

513 school students participated in the study. After adjustment (see Data Screening in ‘Results’ section), the final sample comprised 456 students from across Grade 4 to Grade 7 from four independent, Anglican schools based in South East Queensland. Participants’ ages ranged from 9 to 14 years (9% = 9, 11% = 10, 18% = 11, 41% = 12, 20% = 13, < 1% = 14; Mage = 11.54, SD = 1.20) and 47% were female (Mage female = 11.37; SD = 1.17; Mage male = 11.68, SD = 1.21). Most of the sample was born in Australia (88%), 3% were born in the United Kingdom, 2% in New Zealand, 1% in China and 1% in South Africa, and the remaining 5% were born in other countries within Asia, North America and Europe. 86% lived with both parents, 8% were shared between mother and father, 6% with just their mother or another primary caregiver. 94% of the sample spoke English as their primary language at home, 1% spoke Chinese/Mandarin, 1% spoke Japanese and the remainder spoke other languages (e.g., Afrikaans, Korean).

Procedure

Ethical approval was granted through Griffith University Human Research Ethics Committee (Ref: 2017/858) as part of a larger study on the implementation of an integrated, three-step science-to-service model of care for young people (i.e., Life-Fit-Learning) developed by the second and third authors and a team of researchers at Griffith University. The Life-Fit-Learning system is designed to (a) assess student health and wellbeing using valid, psychometrically sound instruments, (b) provide reflect reports for schools and parents about student health and wellbeing, and (c) connect young people to resources and services to promote and improve their health and wellbeing. Principals of the participating schools requested and approved the implementation of the Life-Fit-Learning system within their school and oversaw the parent consent procedures in which parents provided either written informed consent or responded via each individual school’s parent notification systems (e.g., online submission portals). The principal at each school further approved the use of de-identified student data for reporting and research purposes and inclusion in this study.

Year level coordinators provided the Life-Fit-Learning team with student email addresses, class, date of birth and gender to register students within the Life-Fit-Learning

system the business day prior to the nominated date when students would complete the Assess step. This generated a unique email link for each student so they could access the Assess step of the Life-Fit-Learning system on their iPad or laptop and complete the assessment during regular class time. At the assessment time nominated by the year level coordinators, students completed the online Assess step on their iPads or laptops during class time. A research assistant was in attendance in each classroom to provide standardised instructions to students and answer any questions that arose during the session. Each year level of students completed the Assess step simultaneously during 40–50 min sessions allocated by the year level coordinators. After each student had completed their assessment the online survey closed automatically, and their data were saved to a central, secure server at Griffith University in a de-identified format for each student. Data were collected between April and November 2018.

Measures

Hope was measured via the Children’s Hope Scale (CHS; [30]), a measure of youth hopefulness assessing student capacity to generate paths toward goals (pathway) and persevere toward those goals (agency). Pathway items include, ‘When I have a problem, I can come up with lots of ways to solve it’. Agency items include, ‘I think I am doing pretty well’. The total score is achieved by adding the responses to the six items; each rated on a 6-point scale from 1 (*none of the time*) to 6 (*all of the time*). The CHS has good internal reliability (Cronbach’s alpha of .72–.86) and acceptable test–retest correlations: .71 at 1-month and .73 at 1-week intervals [30]. In the current study reliability was .89.

Student self-efficacy was assessed using the Self-Efficacy Scale for Children (SESC; [54]). The SESC comprises 20-items focussing on eight areas of self-efficacy: academic achievement; self-regulated learning; meeting the expectations of others; social functioning; self-assertiveness; regulation of negative emotions; management of positive emotions; and relationships with parents. The scale contains four self-efficacy subscales: academic achievement (e.g., ‘I can achieve good results at school tests’), negative emotion (e.g., ‘I can calm down easily when I am scared’), positive emotion (e.g., ‘I can enjoy many things that happen to me’) and self-control (e.g., ‘I can sit quietly during the lesson’). Items are rated on a scale of 0–10 where higher number represents greater level of efficacy. Scores are totalled to yield subscale total or overall scale total. The SESC reported moderate to good internal consistency (Cronbach’s alpha) for each of the subscales: positive emotion = .62, academic achievement = .73, negative emotion = .86 and self-control = .86. The total scale was used for the current study and reliability alpha was .94.

Resilience was assessed using the Child and Youth Resilience Measure – 12 (CYRM-12; [55]). The CYRM-12 is the reduced version of the CYRM-28, a measure of youth resilience that accounts for cultural and contextual diversity across youth populations. As the 28-item scale is based on a social ecological model of resilience, development of the shortened version was stringent in its inclusion of items from all three subscales (individual, relational and contextual) that form the longer measure. Items include, ‘I try to finish what I start’ and ‘I am able to solve problems without harming myself or others’. Responses are recorded on a 5-point scale from 1 (*not at all*) to 5 (*a lot*). Scores are summed up to yield an overall resilience score where higher scores reflect higher levels of resilience. The CYRM-12 has shown good to excellent internal consistency (Cronbach’s alpha of .84 and .92) across culturally diverse samples [55, 56]. For the current study reliability was .90.

Optimism was measured via the optimism subscale of the Youth Life Orientation Test (YLOT; [53]). The YLOT is a 14-item measure of which 6 items form the optimism subscale including, ‘I usually expect to have a good day’. Respondents indicate level of agreement on 4-point scale, from 0 (*not true for me*) to 3 (*true for me*). Scores are summed up to yield total, where higher scores representing higher optimism. The optimism scale of the YLOT has demonstrated good internal consistency (Cronbach’s alpha = .79; [53]). In the current study internal consistency was .85.

Student subjective wellbeing was assessed via the 8-item Flourishing Scale (FS; [57]). Each item represents an important component of human functioning: purpose and meaning, positive relationships, engagement, social contribution, competence, self-respect, optimism and social relationships. Items include, ‘I lead a purposeful and meaningful life’ and ‘I actively contribute to the wellbeing of others’. Responses are rated on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Scores are summed up to give an overall total between 8 (lowest possible score) to 56 (highest possible score). A high score is reflective of ‘a person with many psychological resources and strengths’ [57]. In a PsyCap study of school-aged adolescents ($N = 606$, $Mage = 13.87$, 50% female; [25]) the FS has shown good internal consistency (Cronbach’s alpha = .84). In the current study reliability was .88.

Depression and anxiety symptoms were assessed using the Revised Children’s Anxiety and Depression Scale–Short Version (RCADS-SV; [58]). The RCADS-SV is a 25-item scale, comprising 10 items tapping into depression (e.g., ‘I feel sad or empty’) and 15 items capturing a ‘broad anxiety’ factor [58]. The anxiety factor includes facets of social phobia (e.g., ‘I worry what other people think of me’), separation anxiety (e.g., ‘I would feel afraid of being home on my own’), generalised anxiety disorder (e.g., ‘I think about death’), panic disorder (e.g., ‘I start to tremble or shake

when there is no reason for this’), and obsessive–compulsive disorder (e.g., ‘I have to do some things in just the right way to stop bad things from happening’). Items are rated on a 4-point scale from 0 (*never*) to 3 (*always*) and the total score is yielded where higher scores indicate higher symptomatology. The anxiety subscale and depression subscale of the RCADS has reported good internal consistency in school samples (alphas = .86 and .80, respectively; [58]). In the current study reliability co-efficient alphas were .83 (anxiety) and .80 (depression).

Data Analyses

A priori power analysis using G*Power was performed [59]. For multiple regression analyses with effect size of 0.15, error rate of 0.05, and power set to 0.95, a total sample size of 129 was deemed sufficient. Thus, although most previous studies have had larger samples (> 600), the current sample exceeds the minimum required for the planned analyses. All significance testing were performed in IBM SPSS Version 25, with α set at .05 (two-tailed). To ascertain the direction and strength of relationships between independent variables (HERO constructs) and dependent variables (flourishing, anxiety, and depression), correlational analyses were performed to test the hypothesised associations between all variables of interest. Following this, standard multiple regression analyses (enter method) were conducted to test the hypothesised predictive utility of the independent variables of the three dependent variables. Independent variables were evaluated for their unique contribution to the prediction of the dependent variables. The F -test was used to assess PsyCap (collective HERO) as a predictor of the dependent variables in the current sample. Summary models were produced to determine overall model fit to the data for each of the three dependent variables, and effect sizes noted.

Results

Data Screening

513 students participated in the study, however, 27 did not complete entire scales within the survey and therefore their data could not be included for analyses. A total sample $N = 486$ completed the survey with no data points missing. All data were recorded on interval measurement scales, where higher scores indicate higher level of construct measured. Inspection of z-scores revealed 12 extreme data points ($> \pm 3.29$): one on the SESC, two on the CYRM-12, two on the RCADS–anxiety, three on the RCADS–depression and four on the FS. Nine of these data points belonged to five cases. Visual inspection of the raw scores confirmed responses for these eight participants were unusual for this

sample and deleted. Assessment of Mahalanobis distance revealed seven multivariate outliers, where $df = 4$; critical chi-square at $p = .001 = 18.47$ [60] and these were also removed. Casewise diagnostics identified 15 residual outliers: 10 where $DV =$ flourishing, and five where the dependent variable ($DV =$ depression), and these cases were also excluded. The assumptions of normality, linearity and homoscedasticity were assessed, and found to be supported. Specifically, visual inspection of the histogram and normal P–P plots confirmed that the residual terms were normally distributed. Durbin–Watson statistics of 1.900 ($DV =$ flourishing), 1.988 ($DV =$ anxiety), and 1.896 ($DV =$ depression) indicated independence of residuals. A visual inspection of the scatterplot of studentised residuals against unstandardised predicted values confirmed that relationships were linear and homoscedastic. Tolerance and VIF statistics confirmed there were no issues with multicollinearity. The final sample size used for analyses was $N = 456$ (53% male).

Correlational Analysis and Internal Reliabilities

To assess the strength and direction of associations among scores of hope, efficacy, resilience, optimism, anxiety,

depression and flourishing, Pearson’s correlation coefficients were produced via bivariate correlation analyses (Table 1). Hope, efficacy, resilience and optimism significantly positively correlated with each other ($r = .59-.76$), and flourishing ($r = .68-.69$). Hope, efficacy, resilience, and optimism significantly negatively correlated with anxiety ($r = -.33$ to $-.40$), and depression ($r = -.49$ to $-.55$). All relationships were moderate to strong [61]. All measurement scales demonstrated good to excellent internal consistency (see diagonal of Table 1).

Regression Analysis

The unique contribution of each HERO construct to the overall predictive utility for each of the DVs and overall model fit is as follows (see also Table 2).

Flourishing

Individually, hope, efficacy, resilience and optimism were significant predictors of flourishing. Optimism was the strongest predictor; if optimism increased by 1 unit, flourishing increased by .58 units. The unique variance contributed

Table 1 Descriptives, internal reliabilities and correlation coefficients for all variables (N = 456)

Variable	1	2	3	4	5	6	7
1. Hope (CHS)	(.89)	.76*	.71*	.62*	.69*	-.36*	-.51*
2. Efficacy (SESC)	–	(.94)	.75*	.59*	.68*	-.40*	-.53*
3. Resilience (CYRM-12)	–	–	(.90)	.65*	.69*	-.33*	-.49*
4. Optimism (YLOT)	–	–	–	(.85)	.69*	-.39*	-.55*
5. Flourishing (FS)	–	–	–	–	(.88)	-.44*	-.59*
6. Anxiety (RCADS-anx)	–	–	–	–	–	(.83)	.65*
7. Depression (RCADS-dep)	–	–	–	–	–	–	(.80)
Mean	27.08	150.49	51.21	12.53	47.43	10.06	7.18
SD	6.11	32.98	7.59	3.88	6.91	6.38	4.23

CHS Children’s Hope Scale, SESC Self-Efficacy Scale for Children, CYRM-12 Children and Youth Resilience Measure-12, YLOT Youth Life Orientation Test, FS Flourishing Scale, RCADS-anx Revised Children’s Anxiety and Depression Scale-Anxiety subscale, RCADS-dep Revised Children’s Anxiety and Depression Scale-Depression subscale

* $p < .01$, Cronbach’s alphas on the diagonal

Table 2 Regression coefficients for analysis using hope, efficacy, resilience and optimism to predict flourishing, anxiety, and depression (N = 456)

Variable	Flourishing					Anxiety					Depression				
	B	SE _B	β	95% CI for B	sr ²	B	SE _B	β	95% CI for B	sr ²	B	SE _B	β	95% CI for B	sr ²
Intercept	18.90	1.39				21.50	1.88				19.07	1.11			
Hope	.22	.06	.20**	[.12, .33]	.01	-.05	.07	-.05	[-.20, .09]	<.01	-.07	.04	-.10	[-.17, .02]	<.01
Efficacy	.04	.01	.19**	[.02, .06]	.01	-.05	.01	-.28**	[-.08, -.03]	.03	-.03	.01	-.23**	[-.05, -.01]	.02
Resilience	.18	.04	.20**	[.27, .69]	.01	.06	.06	.07	[-.06, .17]	<.01	-.02	.04	-.04	[-.09, .05]	<.01
Optimism	.58	.07	.32**	[.44, .71]	.06	-.38	.10	-.23**	[-.57, -.20]	.03	-.35	.06	-.32**	[-.46, -.24]	.06

** $p < .001$

by hope was 1.4%, efficacy was 1.2%, resilience was 1.4% and optimism was 5.8%, indicating that ~10% of the total variance in flourishing scores could be accounted for by the unique variance of the four individual HERO constructs, leaving ~52% of the variance explained by the combined effect of HERO. The overall regression model was significant, $R = .79$, $R^2 = .63$, $F(4, 451) = 188.60$, $p < .001$, adjusted $R^2 = 62.3\%$, $f^2 = 1.7$ indicated this was a large effect size [61]

Anxiety

The individual constructs of hope and resilience were not significant unique predictors of anxiety; however, efficacy and optimism were. Of these, optimism was the strongest; i.e., if optimism increased by 1 unit, anxiety decreased by .38 units. The unique variance associated with hope was less than 1%, efficacy was 2.6%, resilience was less than 1% and optimism was 2.9%, demonstrating that ~6% of the total variance in anxiety scores accounted for by the model could be attributed to the unique variance of the four HERO constructs individually, leaving ~13% of the variance being explained by the combined effect of these four factors. The overall regression model was significant, $R = .45$, $R^2 = .20$, $F(4, 451) = 28.03$, $p < .001$, adjusted R^2 of 19.2%, $f^2 = .25$ indicated this was a medium effect size [61]. Of further note, although resilience was not a significant predictor of anxiety; there was a change in valence from negative to positive coefficient. That is when resilience levels increase anxiety levels increase, indicating that resilience may be a suppressor variable when anxiety is the outcome variable. The presence of suppressor variables in multiple regression models is not in itself of concern if its inclusion is theory-based and can enhance the predictive power of a model [62], as is the case in the current study.

Depression

The individual constructs of hope and resilience were not significant predictors of depression. Efficacy and optimism were significantly unique predictors of depression. Of these, optimism was the strongest; if optimism increased by 1 unit, depression decreased by .35 units. The unique variance associated with hope was less than 1%, efficacy was 1.7%, resilience was less than 1% and optimism was 5.5%, demonstrating that ~9% of the total variance in depression scores accounted for by the model could be attributed to the unique variance of the four HERO constructs individually, whereas ~27% of the variance was explained by the combined effect of HERO. The overall regression model was significant, $R = .61$, $R^2 = .37$, $F(4, 451) = 65.87$, $p < .001$, adjusted R^2 of 36.3%, $f^2 = .59$ indicated this was a large effect size [61].

Discussion

This study aimed to investigate the individual and collective impact of PsyCap constructs of hope, efficacy, resilience, and optimism, with flourishing, anxiety and depression in Australian school-aged students. Overall, findings supported our study hypotheses in that; (1) significant and positive associations were found between all HERO constructs and flourishing (H1); (2) all HERO constructs were significantly negatively associated with anxiety, and depression (H2); and (3) PsyCap (HERO construct combined) significantly predicted flourishing (H3a), significantly predicted anxiety and depression (H3b), and had greater predictive power than the individual HERO constructs (H3c).

The significant contribution of this study was the finding that the combined PsyCap constructs of hope, efficacy, resilience and optimism accounted for more of the variance in flourishing, anxiety, and depression than each construct alone. This provides encouraging support for the premise that PsyCap is a stronger predictor than individual HERO components in relation to both negative associations of mental health symptoms (anxiety and depression) and positive associations of wellbeing (flourishing) among school-age youth. These results have important theoretical and applied implications for researchers, clinicians, schools and policymakers. They contribute to the PsyCap literature and align with workplace studies that have found PsyCap to be predictive of desirable outcomes (e.g., wellbeing) and undesirable outcomes (e.g., anxiety) in adults. Further, they lend support to the PsyCap theory of the synergistic nature of the four HERO constructs, highlighting the merit of investigating co-occurring positive psychological resources, when exploring outcomes of mental health problems and wellbeing in youth populations. Our findings could also be useful in informing programming within applied educational contexts, for example, current middle school interventions aimed at increasing student wellbeing via resilience programs alone may not be as efficacious as programs that target both efficacy and optimism, or HERO as a collective of resources, which may serve to buffer mental health issues and boost subjective wellbeing in this population.

This novelty of HERO's collective predictive benefit was obtained in the context of findings that are consistent with prior studies, whereby the individual constructs were related (H1) [21, 23]. However, of note was that the strength of associations in the current study ($r = .59-.76$) which were moderate to high [61], were generally higher than those reported in previous studies that examined the inter-correlations of HERO of $r = .15-.63$ [21] and $r = .46-.61$ [23] in youth. This finding could be due to the

higher reliability of scales used in our study, i.e., Cronbach's alphas of .85–.94, compared to Cronbach's alphas of .60–.83 [21] and Omega coefficients of .67–.77 [27], or it may suggest the strength of associations is culture-specific. A further alternative explanation could be that strength of associations are age-specific as our study comprised a younger age group (9–14 year, $M_{age} = 11.34$), compared to previous studies (e.g., [14–17, 21, 23]). Future research assessing PsyCap HERO constructs across age groups and other demographic features (e.g., gender) may help provide a richer understanding of these variations in findings.

The findings of significant associations between the individual HERO components also supports and extends previous finding of relationships between these constructs; for example, resilience and self-efficacy [45]; and optimism and hope [51]. The associations found between individual HERO constructs and anxiety and depression (H2) are consistent with the literature. For example, previous associations have been found between efficacy, anxiety, and depression [38]; and associations between resilience, anxiety, and depression [44]. The associations between the individual HERO constructs and subjective wellbeing, (as measured by flourishing in the current study) support previous findings: for example, hope and emotional wellbeing [31]; and, optimism and emotional wellbeing [50]. A further noteworthy finding of the current study is that among the individual HERO constructs, optimism was the strongest predictor of all outcomes, including flourishing, anxiety, and depression. This is an interesting finding as among the HERO constructs, research into the development of optimism is scarce [52]. Our results would indicate that more research into the origins and antecedents of optimism would be important to better understand approaches that may bolster this positive psychological resource in youth. Our finding for combined HERO predicting flourishing is congruent with a prior study of Filipino youth by Datu and Valdez [25], though as our study indicates, investigation of the individual *and* combined set of HERO constructs may help formulate and inform future research more so than just combined HERO alone.

Limitations and Future Research Directions

Given this study is the first to evaluate PsyCap-HERO (i.e., Psychological Capital as the combined construct of HERO) in Australian school-aged children and adolescents; the results should be interpreted with caution due to several study limitations. Firstly, the cross-sectional design of the current study constrains our findings to associations and predictions. Future research of a longitudinal nature may allow more detailed scrutiny of the individual HERO constructs, PsyCap-HERO, mental health symptoms and subjective

wellbeing across development, encompassing transitional points between primary, middle and high school years; giving insight into potential directional effects of associations. Studies of this nature may also assist in the development of PsyCap-HERO school-based intervention programs and inform optimal timing of interventions.

In regard to interventions, presently there are no evidence-based programs targeting PsyCap-HERO in schools that the authors are aware of. However, the positive organisational behaviour literature presents promising PsyCap Interventions (PCIs) that are brief and appear effective at developing PsyCap-HERO [63]. These interventions typically foster cognitive and meta-cognitive strategies incorporating goal-setting, cognitive rehearsal of goal pursuits via multiple generated pathways, and contingency planning to overcome obstacles to goals [12]; they are tailored to the specific organisational/job/personal context and simultaneously develop participants' hope, efficacy, resilience and optimism (see [63], for PCI protocol). Similarly, evidence-based cognitive and meta-cognitive techniques meeting these criteria appear relevant and appropriate for students and may inform the development of PsyCap-HERO school-based intervention programs. An example of one such strategy is mental contrasting with implementation intentions (MCII), which has been demonstrated as an effective self-regulation technique in successful goal pursuits in students [64, 65]. MCII has been operationalised into the Wish/Outcome/Obstacle/Plan (WOOP) technique which involves: (1) generating a specific wish or goal; (2) naming and mentally visualising best outcomes; (3) identifying personal obstacles to the goal, and (4) formulating 'if...then' plans for obstacles (i.e., *if* this obstacle occurs, *then* I will take this action to overcome it) [66]. The WOOP method aligns well with fostering hope through cognitive-behavioural techniques. Future research seeking to develop youth PsyCap-HERO interventions for implementation across school, clinical or health contexts would make a valuable contribution to the literature and have practical implications for clinicians, educators and students.

Another limitation is the convenience sampling in the current study, which also limits generalisation of our findings. Of note, more research is required to ascertain whether findings can be generalised to children and adolescents across different school districts and across schools of different structure and socio-economic status. Generalisability is important as all children and adolescents face challenges on many levels during their formal school years. Future research aimed at examining PsyCap-HERO in response to individual (e.g., mental health), community (e.g., peer relationships, school connectedness) and global (e.g., COVID-19) stressors may also inform the protective potential of PsyCap-HERO on student well-being during times of significant stress and adjustment.

Furthermore, future studies could improve on the current study's method of PsyCap-HERO measurement. Although reliable and valid instruments were used to capture HERO, the majority of items do not specifically assess domains within the school context, and moreover, there were a disproportionate number of items across scales (ranging from 6 to 20). This means the criteria of a context-specific scale, subscribing to the principle of parsimony; both explicit in PsyCap theory and the development of the workplace gold standard measure of PsyCap, the Psychological Capital Questionnaire [26] were not met. Relatedly, the composite number of items from all the scales is 44, which incurs high respondent burden and may explain why some students did not complete the entire survey. Thus a school-context specific, parsimonious and briefer measure of PsyCap-HERO merits consideration for future research.

Summary

This study found that PsyCap-HERO, comprising the four positive psychological resources of hope, efficacy, resilience, and optimism, might be a stronger and more significant predictor of flourishing, anxiety and depression, than the individual HERO constructs alone. This provides important evidence in support of PsyCap-HERO applied to youth and warrants further studies of a PsyCap-HERO measure that can be tailored to educational contexts in particular given PsyCap-HERO's development within workplace settings and the significant role of educational contexts in young people's lives. A psychometrically robust tool utilised longitudinally across numerous age groups in primary and high school could provide schools, researchers, and clinicians with a greater understanding of youth PsyCap, and its impact on various important student domains, such as wellbeing, mental health, engagement and performance outcomes.

Acknowledgements Seed funding from the Menzies Health Institute of Queensland supported this research. The authors would like to thank Olivia Elvin, Katherine Ryan, Shelly Weaver and Tiah Dowell for their assistance with data collection.

Compliance with Ethical Standards

Conflict of interest The authors have no conflict of interest to declare.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of Griffith University's Human Research Ethics Committee (ethical approval number 2017/858).

Informed Consent Informed consent was obtained from the parent/guardian of each participant in the study.

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