



Linking positive emotions and academic performance: The mediated role of academic psychological capital and academic engagement

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Published online: 22 March 2019

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Abstract

The present study examined the relationship between positive emotions and academic performance, and the mediated role played by academic psychological capital and academic engagement, in a sample of 497 Chilean high school students. Participants' ages ranged from 14 to 17 years old, with a mean of 15.71 (SD = 1.15). Findings supported our hypothesized model that academic psychological capital and academic engagement mediate the relationship between positive emotions and academic performance (GPA). The proposed model has theoretical implications for future research and practical implications for school settings. The promotion of positive emotions in students is a relevant challenge for principals, teachers, and parents in attempting to build academic psychological capital and academic engagement, which in turn may lead to higher academic performance.

Keywords Positive emotions · Academic psychological capital · Academic engagement · Academic performance · High school students

Introduction

Interest in Positive Psychology and its applications in educational settings has grown exponentially in recent years (Stiglbauer et al. 2013). Special attention has been paid to the way positive emotions shape academic engagement and performance (Linnenbrink-Garcia and Pekrun 2011; Pekrun and Linnenbrink-García. L. 2012). In addition, some scholars have found that psychological capital (PsyCap) -a concept that was initially examined in work settings, and simultaneously encompasses efficacy, optimism, hope, and resilience- may play an important role in facilitating desirable student outcomes (Luthans et al. 2012). However, studies in the field have mainly been conducted in undergraduate university students, and none of them have focused on its antecedents.

Thus, more research is needed to assess: 1) the applicability of academic PsyCap in school settings and 2) the possible antecedents of academic PsyCap.

The current study addresses both issues by proposing a theory-driven model -based on the broaden-and-build (or B&B) theory (Fredrikson 1998) and the conservation of resources (or COR) theory (Hobfoll 2002)- to examine how positive emotions predict the appearance of personal resources, such as academic PsyCap, which, in turn, enhances desirable outcomes such as academic engagement and academic performance. In other words, the aim of the study is to examine the indirect relationship between positive emotions and academic performance through sequential mediation by academic PsyCap and academic engagement, respectively. Providing empirical evidence about the possible antecedents of academic PsyCap and its applicability in a school setting may make an important contribution to understanding how high school students build personal resources, making it possible to develop evidence-based future interventions designed to enhance students' academic PsyCap and academic well-being.

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Literature Review

Positive Emotions and the B&B Theory

Research on positive emotions has increased since the emergence of Positive Psychology, and a landmark in its development

was the appearance of the B&B theory (Fredrikson 1998). This theory specifies two main hypotheses: the “broaden hypothesis” and the “build hypothesis”. According to the broaden hypothesis, positive emotions temporarily “broaden” people’s attention and thoughts, giving them the capacity to access a wider range of ideas. In turn, and according to the second hypothesis, these broadened outlooks help people to discover and “build” important personal resources (Fredrikson 2001).

The current study focuses on the second assumption of broaden-and-build theory. People who experience and express positive emotions show an increase in their personal resources and are more likely to function at optimal levels and show high performance (Fredrikson 2013). For example, Oriol-Granado et al. (2017) found that positive emotions influence self-efficacy and academic engagement, which, in turn, predict academic performance. Furthermore, Ouweneel et al. (2011) reported that students’ experiences of positive emotions predict their future personal resources, such as optimism and hope, which, in turn, predict their future academic engagement. Finally, Salanova et al. (2011) found that efficacy beliefs reciprocally influence academic engagement indirectly through their impact on positive affect.

Taken together, empirical evidence shows that positive emotions can play a relevant role in explaining how students build their personal resources and, thus, seems to confirm the “build” hypothesis. The explanation here is that positive emotions are associated with approach-oriented behavior (Elliot and Thrash 2002). That is, when students are in a positive mood, they are more likely to explore novel situations, interact with other people, have higher expectations about attaining academic-related goals, and pursue new goals (Carver 2003).

Despite the attention research has paid to examining how positive emotions are associated with each individual dimension of PsyCap (e.g., efficacy: Oriol-Granado et al. 2017; Salanova et al. 2011; hope, efficacy and optimism: Ouweneel et al. 2011), there is limited research on the link between positive emotions and the entire higher-order PsyCap construct. That is, previous studies in the field have investigated PsyCap only partly and incompletely, which is an important limitation because PsyCap may have a different nomological network for each of its four components (Datu et al. 2016). In other words, it may be premature to consider that previous evidence about its individual components (i.e., efficacy, optimism, hope, and resilience) will be equivalent if we consider the entire PsyCap construct.

Thus, based on Luthans, and Youssef-Morgan (2017) and the aforementioned research, we propose that positive emotions may be a key mechanism through which academic PsyCap operates.

Academic PsyCap and the COR Theory

PsyCap is an individual’s positive psychological state of development characterized by efficacy, optimism, hope, and

resilience (Luthans et al. 2015). Efficacy refers to having enough confidence to accept and put in the necessary effort to succeed at challenging tasks. Optimism refers to making a positive attribution about succeeding now and in the future. Hope refers to persevering on goals and, when necessary, redirecting paths toward goals in order to succeed. Resilience refers to holding on and bouncing back, and even beyond, to attain success when facing problems and adversity (Luthans & Youssef-Morgan, 2017).

According to COR theory, resources do not exist in isolation because people try to accumulate as many resources as possible (Hobfoll 1989). An example of a combination of personal resources (so-called resource caravans) is the PsyCap construct. Previous research showed that it explains significant variance in desirable psychological outcomes in work settings, such as job satisfaction, organizational commitment, and citizenship (for a meta-analytic revision, see Avey et al. 2011b). According to conservation of resources theory, this occurs because a person who can draw on many resources has the ability to solve problems that can arise in stressful situations, and s/he is likely to remain engaged during goal pursuit (Hobfoll 2002; Hobfoll et al. 2018).

Recently, the beneficial role of academic PsyCap in facilitating positive student outcomes was reported. For example, Luthans et al. (2012) found a positive relationship between academic PsyCap and academic performance in US university students. In a similar sample, Riolli et al. (2012) showed that academic PsyCap mediated between stress and psychological symptoms. Liao and Liu (2015) reported a positive relationship between academic PsyCap and competence in Chinese university students. Also in a Chinese sample, Liu et al. (2015) reported a positive relationship between academic PsyCap and academic adjustment. Finally, Siu et al. (2014) established a reciprocal relationship between academic PsyCap and academic engagement (i.e., vigor, dedication, and absorption). In a school setting, Datu et al. (2016) reported that academic PsyCap improves motivation, cognitive and affective engagement, and achievement in a sample of students from the Philippines. Finally, also in a Philippine sample, Datu and Valdez (2016) reported that academic PsyCap predicts flourishing, interdependent happiness, and positive affect.

Taken together, these studies show that academic PsyCap is a key resource that enhances students’ ability to develop. The reason for this is that PsyCap facilitates positive cognitive appraisals of events and the processes necessary for attention, interpretation, and retention of positive and constructive memories that lead to well-being and success (Luthans, and Youssef-Morgan 2017). However, further research would make it possible to assess whether the PsyCap construct can be applied in a school setting, and examine -simultaneously- its possible antecedents (e.g., positive emotions) and consequences (e.g., academic engagement), as well as its role in

objective measures of performance (i.e., GPA). These research efforts could expand the literature on academic PsyCap in the high school context and also contribute to the objective of the positive education, that is, education to achieve both traditional skills and for happiness (Seligman et al. 2009).

Academic Engagement

In previous research, school engagement -the engagement that occurs in a school setting- has typically been defined as a construct that includes behavioral, cognitive, and affective components (Fredricks et al. 2004; Salmela-Aro 2015). However, recent research in this area demonstrated that school engagement can also be considered an overall concept -called schoolwork or academic engagement- which refers to a positive, fulfilling, study-related state of mind characterized by vigor, dedication, and absorption (Schaufeli et al. 2002).

Of these three dimensions, vigor refers to high levels of mental resilience while studying, a willingness to invest effort in one's schoolwork, and a positive approach (Schaufeli et al. 2002). Dedication is characterized by a sense of significance, enthusiasm, pride, identification, and inspiration toward school, in addition to perceiving schoolwork as meaningful (Schaufeli et al. 2002). Absorption is characterized by behavioral accomplishments and flow-like experiences, such as being so fully immersed and happily engrossed in one's studying that time passes quickly (Schaufeli et al. 2002). Although it is generally accepted that this approach includes three components, its authors have specified that vigor and dedication make up the core of engagement, whereas absorption could be considered as a consequence of engagement (Schaufeli and Salanova 2007).

Previous research conducted in high school populations has shown that this academic engagement approach -which was initially proposed as a work-related construct- is positively associated with self-esteem (Salmela-Aro and Upadyaya 2012), self-efficacy (Salmela-Aro and Upadyaya 2014), satisfaction with studies (Upadyaya, and Salmela-Aro 2014), and academic performance (Wang et al. 2015). In other words, personal resources -such as self-efficacy and self-esteem- foster academic engagement and have positive consequences for students, such as high academic performance and satisfaction. In addition, academic engagement is negatively associated with school burnout, study demands, and depressive symptoms (Upadyaya, and Salmela-Aro 2014).

Although Schaufeli and colleagues' engagement approach has gained empirical support in school settings (see Salmela-Aro 2015), little is known about its relationship with other constructs borrowed from the industrial-organizational context, such as academic PsyCap. In other words, the relationship between academic PsyCap and academic engagement has not been investigated. Providing empirical evidence about the relationship between these constructs is of interest because

previous research in work settings has demonstrated that PsyCap is an important predictor of longitudinal changes in work engagement (Alessandri et al. 2018). This result could indicate -according to the previously mentioned research in school settings (Salmela-Aro and Upadyaya 2014; Upadyaya, and Salmela-Aro 2014; Wang et al. 2015)- that PsyCap (a personal resource) operates as a facilitator of increased work engagement.

Present Study

The aim of the current study is to examine the indirect relationship between positive emotions and academic performance through sequential mediation by academic PsyCap and academic engagement, respectively. The line of reasoning is the following: When students experience positive emotions more often -according to B&B theory- they will probably report a large number of personal resources (in our case, academic PsyCap), and -according to COR theory- these PsyCap may facilitate students' engagement with their academic tasks, which will probably be translated into better academic performance. In other words, positive emotions will help students to envision goals and challenges and open their minds to productive ways of thinking and problem-solving, thus making them feel more engaged in their studies and, hence, achieve higher academic performance (Pekrun et al. 2002).

Based on the arguments presented, we have specified and tested a structural equations model (Fig. 1) that allows us to test the following hypothesis: Positive emotions are indirectly and sequentially associated with academic performance through academic PsyCap and academic engagement, respectively.

Method

Participants and Procedures

The sample comprised 497 (51% female) Chilean high school students. The students came from 36 classes in three different secondary schools (each of them hosted approximately 500 students). They ranged from 14 to 17 years old ($M = 15.71$, $SD = 1.15$). Of the 497 students, 16.5% ($n = 82$) were 14 years old, 29.4% ($n = 146$) were 15 years old, 25.8% ($n = 128$) were 16 years old, and 28.3% ($n = 140$) were 17 years old when the data were collected.

This study was part of a project designed to examine the role of non-intellectual variables in academic performance, and it received approval from the Research Ethics Committee of the host university. The study took place over 5 days in the middle of a regular academic semester, and two trained administrators supervised it. The students who agreed to participate in the study -after school principals and parents

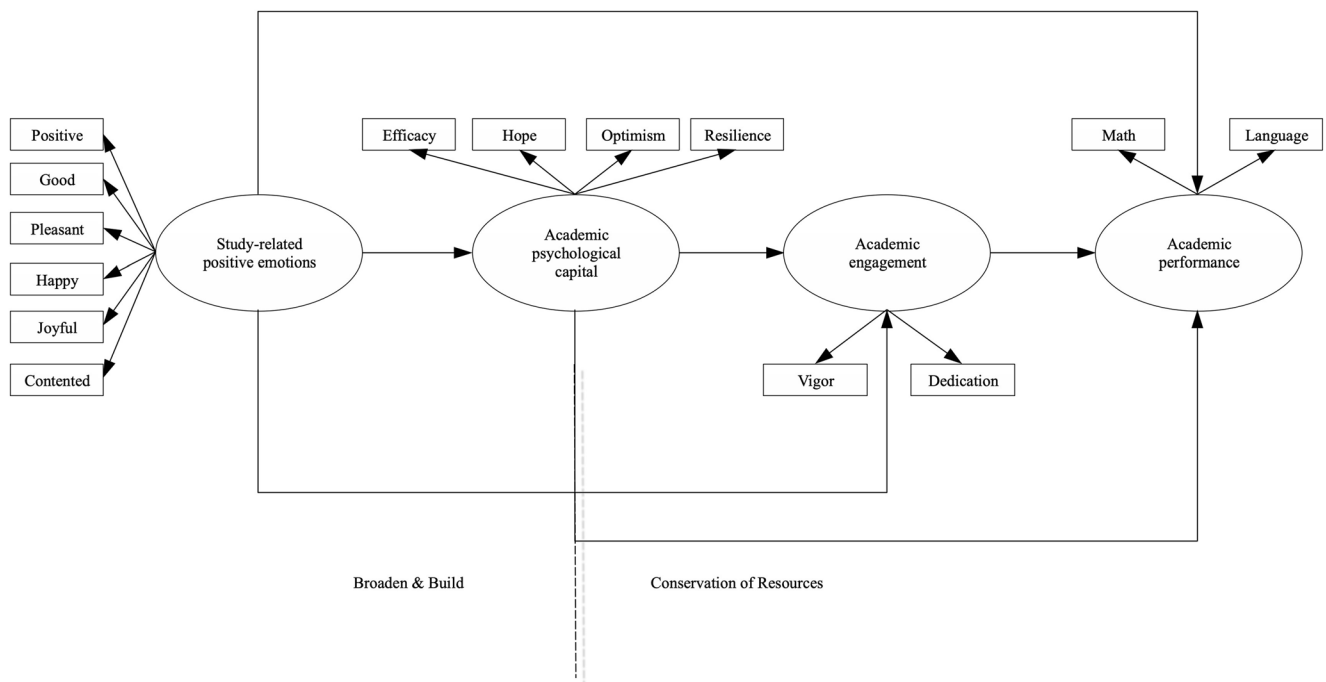


Fig. 1 Theory-driven proposed model

gave their permission- were taken to a classroom where a computer was available containing the questionnaire. Participants were encouraged to respond as truthfully as they could, and they received assurance that their responses would be anonymous. They took about 20 min to fill out the questionnaire.

Measures

Positive emotions were measured using the Scale of Positive and Negative Experiences (SPANE; Diener et al. 2010), adapted to the Chilean academic context (Carmona-Halty and Villegas-Robertson 2018). This scale includes 12 items that measure positive (six items) and negative (six items) emotional experiences, rated on a scale of 1 (*very rarely or never*) to 5 (*very often or always*). For the purposes of this study, only the positive feelings subscale was used, and the scale instructions were adjusted by adding a specific reference to the academic context (e.g., “My studies make me feel happy”). Cronbach’s alpha for the overall scale was .92.

Academic PsyCap was measured using the Psychological Capital Questionnaire-12 (PCQ-12; Avey et al. 2011a), adapted to the Chilean academic context (Martinez et al. 2018). The Academic PCQ-12 contains 12 items that measure the four dimensions of the PsyCap construct: (1) efficacy (e.g. “I feel sure when sharing information about my studies with other people”); (2) hope (e.g. “Right now I see myself as being pretty successful in my studies”); (3) optimism (e.g. “Concerning my studies, I’m optimistic about what the future offers me”); and (4) resilience (e.g. “I usually take the stressful

aspects of my studies in stride”). Responses were given on a Likert-type scale with scores from 1 (*strongly disagree*) to 6 (*strongly agree*). Cronbach’s alpha for overall academic PsyCap was .85.

Academic engagement was measured using the student version of the Utrecht Work Engagement Scale (UWES-9; Schaufeli et al. 2006), adapted to the Chilean context (Carmona-Halty et al. 2018). This scale contained 9 items that measure the three components of the engagement construct: vigor (e.g. “When I get up in the morning, I feel like going to class”); dedication (e.g. “I’m enthusiastic about my studies”); and absorption (e.g., “I get carried away when I am studying”). Participants gave their responses on a Likert-type scale with scores from 0 (*never*) to 6 (*always*). In the present study, only the *core engagement* items were used (i.e., vigor and dedication). Cronbach’s alpha for core academic engagement was .83.

Academic performance was measured as the grade point average (GPA) in two core subjects in the Chilean education program: math and language. The GPA ranged from 1 (*poor*) to 7 (*excellent*). The GPA was recorded at the end of the semester, when the data collection took place. Thus, each academic performance indicator covered the period when the questionnaire was administered.

Data Analysis

First, to test for common method variance bias, we applied Harman’s single-factor test. Second, a confirmatory factor analysis (CFA) was specified to test the proposed

measurement structure underlying the data. Third, structural equation modelling (SEM) analysis tested the structural relations in the hypothesized model. We used maximum likelihood estimation methods, and we evaluated the goodness-of-fit using: chi-square (χ^2) and normed chi-square (χ^2/df), Root-Mean-Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Standardized Root Mean Residual (SRMR). To help evaluate the cut-off point and ascertain model fit, we followed previous recommendations from the European Journal of Psychological Assessment (Schweizer 2010). Fourth, to test indirect effects, we implemented the bootstrap procedure with 5000 re-samples, constructing 95% bias-corrected and accelerated (BCa) confidence intervals (CI).

Results

Preliminary Analysis

Table 1 shows means, standard deviations, skewness, kurtosis, reliability, and the relationship between study variables. Cronbach's alpha was satisfactory for all study variables (i.e., $\alpha > .60$). However, in order to cross-validate our findings -following Sijtsma (2009)- we also computed McDonald's omega reliability index, which produced similar results. Moreover, Harman's single factor test reveals indicators under the recommended fit standards (Table 3, M1). Thus, we concluded that it is unlikely that bias due to common method variance may have affected the study results. In addition, t-tests did not reveal any significant gender, age, or grade differences in the study variables.

Measurement and Structural Model

The measurement model (M2) consisted of four latent factors and 14 indicators. Specifically, positive emotions had six indicators (i.e., feeling positive, good, pleasant, happy, joyful, and contented); academic PsyCap had four indicators (i.e., efficacy, hope, resilience, and optimism); academic engagement had two indicators (i.e., vigor and dedication); and

academic performance had two indicators (i.e., math performance and language performance).

The results of the CFA showed an acceptable fit for the measurement model (see Table 3, M2). As Table 2 reveals, the factor loadings were statistically significant at $p < .001$, and they achieved the factor-loading criterion of .35 (Byrne 2010). In addition, factor correlation estimates were statistically significant and in the expected direction.

Considering the acceptable fit of the measurement model (M2), we conducted a SEM analysis to test the hypothesized model. Results showed that the proposed model exceeded the recommended standards and provided a good representation of the sample relations (see Table 3, M3). Figure 2 displays this model with standardized regression weights. The significant direct path coefficients were: 1) from positive emotions to academic PsyCap ($\beta = .63$, $p < .05$), 2) from academic PsyCap to academic engagement ($\beta = .76$, $p < .05$), and 3) from academic engagement to academic performance ($\beta = .17$, $p < .05$). The figure shows the following non-significant direct path coefficients: 1) from positive emotions to academic engagement ($\beta = .02$, $p > .05$), 2) from academic PsyCap to academic performance ($\beta = .11$, $p > .05$), and 3) from positive emotions to academic performance ($\beta = .03$, $p > .05$). The proposed model explained significant proportions of variance in academic PsyCap (39%), academic engagement (56%), and academic performance (6%).

Test for Mediation

The significance of the indirect effect was determined at the level of .05 in this study; the indirect effect was considered statistically significant if the estimates of the 95% CI did not contain zero. Supporting our hypothesis, we found a significant indirect effect from positive emotions to academic performance via academic PsyCap and academic engagement; $ab = .12$, $SE = .02$, BCa 95% CI [.08, .18].

Additional Analysis

In order to assess the plausibility of an alternative sequence, we tested an additional model (i.e., positive emotions →

Table 1 Mean (M), Standard Deviation (SD), Skewness, Kurtosis, Omega (Ω) and Alpha (α) indexes, and correlations for the study variables

	M	SD	Skewness	Kurtosis	Ω	α	1	2	3	4
1. Study-related positive emotions	3.66	.88	-.51	-.19	.82	.92	-			
2. Academic PsyCap	3.50	.70	-.43	-.01	.85	.85	.53**	-		
3. Academic engagement	3.01	.82	-.14	-.29	.82	.83	.42**	.59**	-	
4. Academic performance	5.83	.44	-.24	-.52	na	na	.16**	.22**	.17**	-

Note: ** = $p < .001$; na = not applicable

Table 2 Standardized factor loadings and correlations from the measurement model

Indicators	Factor A study-related Positive Emotions	Factor B academic PsyCap	Factor C academic engagement	Factor D academic performance
1-positive	.79**			
2-good	.80**			
3-pleasant	.79**			
4-happy	.86**			
5-joyful	.83**			
6-contented	.83**			
7-efficacy		.61**		
8-hope		.79**		
9-optimism		.60**		
10-resilience		.71**		
11-vigor			.70**	
12-dedication			.94**	
13-Math				.95**
14-Language				.80**
Factor correlations				
Factor A	-			
Factor B	.63**	-		
Factor C	.46**	.74**	-	
Factor D	.17**	.25**	.27**	-

Note: ** = $p < .001$

academic engagement → academic PsyCap → academic performance) because previous research has found reciprocal relations between PsyCap and engagement (Alessandri et al. 2018; Siu et al. 2014). Results did not support this alternative model because the direct effect from PsyCap to academic performance ($\beta = .10, p > .05$) was not statistically significant.

Discussion

This study and its findings are relevant in many ways. The theoretical contribution emphasizes the role of PsyCap and engagement in the positive emotions and performance relationships, whereas the practical contribution lies in focusing on the possible ways to increase the study variables through future evidence-based programs. In addition, although some limitations must be mentioned, this study’s strongest point is

that it allows us to propose suggestions for future research. We describe each one next.

Theoretical Contribution

First, consistent with previous research on the B&B theory (Fredrikson 1998), we found that students who more frequently experienced positive emotions related to their studies were more likely to report higher levels of personal resources in the form of PsyCap (Oriol-Granado et al. 2017; Ouwenel et al. 2011; Salanova et al. 2011). In a similar vein, our findings confirmed that the academic PsyCap construct plays a key role in the educational setting. In addition, our results showed that positive emotions could be considered a key variable associated with academic PsyCap.

Second, consistent with previous research on the COR theory (Hobfoll 2002), we found that students who showed high

Table 3 Results from SEM analysis

	χ^2	<i>df</i>	χ^2/df	CFI	RMSEA	90% CI RMSEA	SRMR
M1 Harman’s single factor test	1302.32	80	16.91	.68	.17	[.17, .18]	.120
M2 Structural model	277.45	71	3.90	.94	.07	[.06, .08]	.049
M3 Proposed model	277.45	71	3.90	.95	.07	[.06, .08]	.050

Notes: * = $p < .001$; χ^2 = Chi-square; *df* = degree of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation;

CI confidence interval, *SRMR* Standardized Root Mean Square Residual

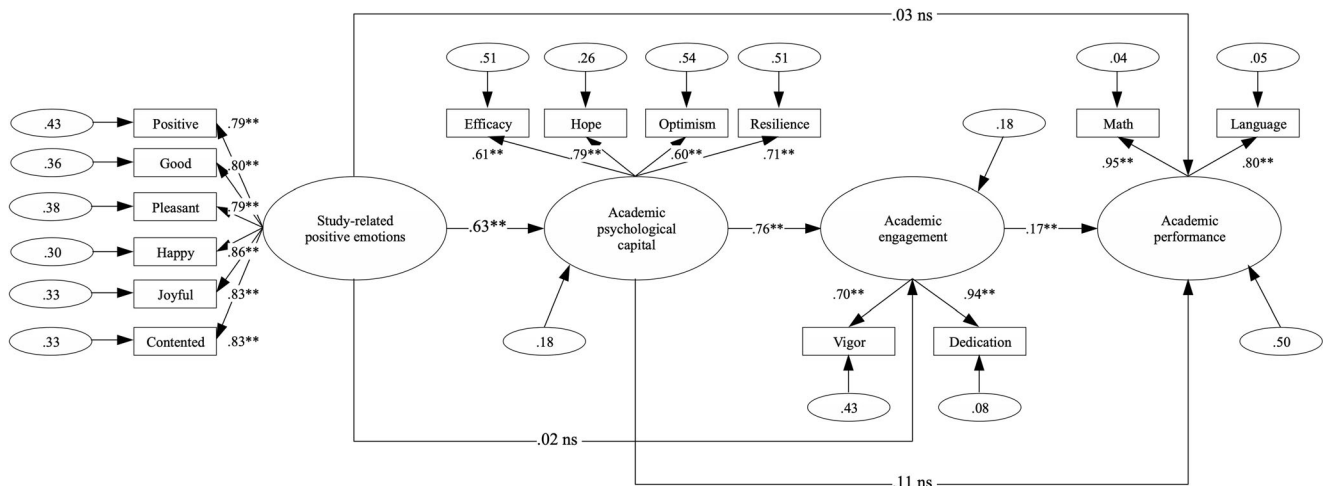


Fig. 2 Results for SEM analysis. Numbers next to the arrows represent the standardized direct effects of all the latent variables in the model. ** = $p < .001$. Numbers inside circles represent the estimated error of each variable. ns = $p > .05$

levels of personal resources (academic PsyCap in our case) were more likely to show positive outcomes (Oriol-Granado et al. 2017; Ouweneel et al. 2011; Salanova et al. 2011). As a positive outcome, we considered academic engagement, which has recently been adapted from the organizational context (Schaufeli et al. 2002) to the school context (Salmela-Aro and Upadyaya 2012). Thus, our findings showed that (academic) PsyCap can be considered a relevant personal resource in explaining academic engagement, which is consistent with prior research in the work setting emphasizing the role of PsyCap in work engagement (see Alessandri et al. 2018).

Third, consistent with previous research on academic engagement, the results showed that students who experienced more vigor and dedication in their studies had a greater probability of achieving high academic performance (Salmela-Aro and Upadyaya 2012). Furthermore, this result is consistent with extensive research that demonstrated a significant relationship between work engagement and job performance (see Schaufeli 2017). Thus, academic performance was more effective when students had positive and active attitudes, with affect (dedication) and energy (vigor) in doing their schoolwork.

Fourth, consistent with previous cross-sectional, longitudinal, and experimental research on the hypothesis that happiness precedes and leads to (academic) success (see, Lyubomirsky et al. 2005; Walsh et al. 2018), we found that students who experienced a higher frequency of positive emotions were more likely -through academic PsyCap and academic engagement- to obtain high academic performance. Thus, the results confirmed our hypothesized model, whereas an alternative model in which the order of the two mediators was switched did not confirm the sequential mediation effect. In addition, given that the introduction of academic PsyCap and academic engagement reduced the direct effect of positive

emotions on academic performance to zero, we can conclude that academic PsyCap and academic engagement fully mediated the relationship between positive emotions and academic performance.

Overall, our study's contribution to the research on the association between positive emotions and objective school performance is innovative because it emphasizes the intermediate role of academic PsyCap and engagement.

Practical Implications

The first practical implication of our study is related to the possible consequences of increasing students' positive emotions. Rather than focusing exclusively on increasing knowledge and academic skills (i.e., academic performance), our results suggest that teachers should also focus on students' feelings. This focus on increasing positive emotions will ultimately -through academic PsyCap and academic engagement- translate into better academic performance. Along these lines, there are several ways teachers can improve the frequency of positive emotions, for example, by encouraging students' capability and giving positive feedback about their effort. Furthermore, teachers can demonstrate involvement (i.e., caring about and showing interest in the student), provide structure (i.e., setting clear rules and following through), and be supportive of autonomy (i.e., allowing students the freedom to make choices and identifying connections between academic work and students' interests). In other words, teachers can support the basic psychological needs of their students (Deci and Ryan 2002).

Second, following the logic of our model, directly increasing academic PsyCap and/or academic engagement will also increase academic performance. Previous research has shown the possibility of developing PsyCap, focusing on the promotion of its four components (Luthans et al. 2008; Luthans et al.

2010). It would be interesting to analyze this possibility in a school context because, to date, there is no previous research in the field. Furthermore, based on the demands-resources model (Bakker and Demerouti 2007), it is possible (and desirable) to provide a balance between study resources (e.g. social support) and study demands (e.g., homework overload) as a way to increase academic engagement and decrease academic burnout (see Hodge et al. 2017; Salmela-Aro and Upadaya 2014).

Third, the notion of crossover -the process that operates when a stressor or psychological strain experienced by one person affects the level of strain of another person in the same social environment- could be taken into account in order to provide the transferred emotions, PsyCap, and engagement levels among the students (see Westman et al. 2009; Westman et al. 2013). For instance, Westman (2001) proposed that crossover mechanisms (i.e., direct, indirect, and spurious) can be applied to both negative and positive experiences and resources. Thus, just as strain in one partner may yield an empathic response in the other, increasing his/her strain, the positive emotions, PsyCap, and engagement in one partner may increase the other partner's engagement (Hobfoll et al. 2018).

Strengths, Weaknesses, and Suggestions for Future Research

The strong points of the current study are: first, it successfully integrates the B&B theory and the COR theory, in that positive emotions lead to personal resources (i.e., academic PsyCap), which, in turn, lead to academic well-being (i.e., academic engagement); second, following the logic of our model, we have included an objective measure of performance (i.e., GPA) as a consequence of academic engagement; and third, the GPA was recorded when the semester ended, before the data were collected.

However, there are some weaknesses that have to be acknowledged. First, this cross-sectional study did not allow us to establish the causality of the phenomena examined. In fact, for our model -with two mediators- we would need four measurement points, coinciding with the temporal positioning of the constructs involved in the proposed model. Despite this limitation, we proposed a theory-driven model based on recent research with empirical support from cross-sectional, longitudinal, and experimental studies (see Walsh et al. 2018). In addition, we tested an alternative model, and the results did not support it. Second, the use of self-report psychological measures may produce common method bias. Therefore, it would be necessary to include different response formats (e.g., Likert scales and faces scales), media (e.g., computer and paper and pencil), and/or locations (e.g., different rooms or sites). However, we used Harman's single factor test and considered some procedural remedies before data collection

(see Podsakoff et al. 2003). Thus, common method bias is unlikely.

Finally, some avenues for future research can be mentioned. First, based on the substantial role played by interpersonal relationships in students' outcomes and experiences at school, positive emotions could be considered as a consequence of teacher-student relationships (see Cornelius-White 2007; Roorda et al. 2011). Second, based on the crossover model (see Westman et al. 2009, 2013), teachers' own job-related positive emotions, PsyCap, and work engagement could be included in a comprehensive model by examining their role in the components of the proposed model. Third, because our results are consistent with previous research conducted in work settings, it is likely that we are dealing with a general psychological principle that is independent from the specific context. Thus, it would be interesting to examine our model in other settings, such as sports or voluntary work, in order to confirm its applicability. Fourth, these avenues could be examined using quadratic relationships and multilevel analysis in order to improve our knowledge about the relationships among positive emotions, academic PsyCap, academic engagement, and academic performance.

Acknowledgments This work was supported by Universidad de Tarapacá, Chile [UTAMayor Award Number 3749-18]; Ministerio de Economía, Industria y Competitividad, España [Award Number PSI2015-64933-R]; Universitat Jaume I, España [Award Number UJI-B2017-81].

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflicts of interest.

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