

Journal of Happiness Studies

How Psychological Capital Mediates Between Study-Related Positive Emotions and Academic Performance

--Manuscript Draft--

Manuscript Number:	JOHS-D-17-00290R2
Full Title:	How Psychological Capital Mediates Between Study-Related Positive Emotions and Academic Performance
Article Type:	Original Research
Keywords:	positive emotions; psychological capital; academic performance
Corresponding Author:	Marcos A. Carmona-Halty, M.D. Universidad de Tarapacá CHILE
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	Universidad de Tarapacá
Corresponding Author's Secondary Institution:	
First Author:	Marcos A. Carmona-Halty, M.D.
First Author Secondary Information:	
Order of Authors:	Marcos A. Carmona-Halty, M.D. Marisa Salanova, PhD Susana Llorens-Gumbau, PhD Wilmar B. Schaufeli, PhD
Order of Authors Secondary Information:	
Funding Information:	
Abstract:	<p>The present study, based on broaden-and-build theory, examines the relationship between study-related positive emotions and academic performance, and the mediating role of psychological capital in this relationship. A sample of 639 Chilean high school students between 14 and 17 years old was used. Through structural equation modelling (SEM), -as hypothesized- a statistically significant indirect effect was found between study-related positive emotions and academic performance via psychological capital. Students' study-related positive emotions were related to better academic performance through positive relationships with their levels of psychological capital (i.e., efficacy, hope, optimism, and resilience). Theoretical and practical implications of the results are discussed, limitations are mentioned, and future research directions are proposed.</p>

Running Head: POSITIVE EMOTIONS, PSYCHOLOGICAL CAPITAL AND ACADEMIC PERFORMANCE

How Psychological Capital Mediates Between Study-Related Positive Emotions and Academic

Performance

Abstract

The present study, based on broaden-and-build theory, examines the relationship between study-related positive emotions and academic performance, and the mediating role of psychological capital in this relationship. A sample of 639 Chilean high school students between 14 and 17 years old was used. Through structural equation modelling (SEM), –as hypothesized– a statistically significant indirect effect was found between study-related positive emotions and academic performance via psychological capital. Students' study-related positive emotions were related to better academic performance through positive relationships with their levels of psychological capital (i.e., efficacy, hope, optimism, and resilience). Theoretical and practical implications of the results are discussed, limitations are mentioned, and future research directions are proposed.

Keyword: positive emotions; psychological capital; academic performance

Running Head: POSITIVE EMOTIONS, PSYCHOLOGICAL CAPITAL AND ACADEMIC PERFORMANCE

1 The recent shift from a negative perspective focused on problems and deficits to a more positive
2 perspective focused on strengths and personal resources has aroused considerable attention in educational
3 research (Seligman, Ernst, Gilham, Reivich & Linkins, 2009; Stiglbauer, Gnambs, Gamsjäger & Batinic, 2013).
4 In this context, psychological capital (PsyCap) has begun to be assessed in educational settings (Datu, King &
5 Valdez, 2016; Luthans, Luthans & Jensen, 2012; Siu, Bakker & Jiang, 2014; You, 2016). However, previous
6 studies focused only on academic outcomes, and not on their antecedents. The broaden-and-build theory (B&B;
7 Fredrikson, 1998; 2001) offers a conceptual framework with which to understand how the experience of positive
8 emotions may explain the presence of students' PsyCap (and other personal resources) and its direct and indirect
9 impact on academic performance. However, we know very little about the interactions among these variables.
10 The present study examines the mediator role of psychological capital between study-related positive emotions
11 and academic performance in a sample of Chilean high school students.
12
13
14
15
16
17
18
19
20
21

22 **Positive Emotions and the B&B Theory**

23
24 Positive emotions are brief, multisystem responses to some change in the way people interpret or
25 appraise their current circumstances (Fredrikson, 2013). They arise when this multisystem registers good
26 prospects or good fortune. B&B theory describes how positive emotions broaden awareness and helps to build
27 (personal) resources (Fredrikson, 1998). The main assumption of B&B theory is that positive emotions expand
28 the array of thoughts, actions, urges, and dispositions that spontaneously come to mind (Fredrikson, 1998;
29 2001). That is, under the influence of positive emotions, people have greater perceptual access, wider semantic
30 reach, more inclusive and connected social perceptions, and more relaxed and expansive bodily behaviour
31 (Fredrikson, 2013). In addition, the function of the expansive form of positive emotions is to spur the
32 development of personal resources, placing people on positive trajectories of growth (Fredrikson, 1998; 2001;
33 2013). In other words, by experiencing positive emotions, people will enhance their personal resources, which
34 in turn, may lead to a more enduring positive state of well-being and future positive outcomes (Fredrikson,
35 2013; Fredrikson, Tugade, Waugh & Larkin, 2003; Lyubomirsky, King & Diener, 2005; Mauss et al., 2011).
36
37
38
39
40
41
42
43
44
45
46
47

48 The current study is based on this assumption of the B&B theory, which is referred to as the "build
49 hypothesis". This hypothesis states that the role of positive emotions is to build personal resources and produce
50 well-being. Previous research has confirmed the association between positive emotions and personal resources.
51 For example, using a diary study with university professors, Ouweneel, Le Blanc, Schaufeli & van Wijhe (2012)
52 found that positive emotions predicted hope, which, in turn, was related to work engagement. Salanova, Llorens
53 & Schaufeli (2011), in two longitudinal studies with professors and students, reported that their beliefs of
54
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

efficacy and engagement influenced each other through experiencing positive emotions. Xanthopoulou, Bakker, Demerouti & Schaufeli (2012) carried out a diary study showing that work resources influence personal resources through positive emotions. Using an undergraduate sample, Rogaten & Moneta (2015) found a reciprocal relationship between positive emotions and creative cognition. Finally, Ouweneel, Le Blanc & Schaufeli (2011), in a longitudinal study with university students, showed that positive emotions predicted efficacy, hope and optimism, and these factors, in turn, predicted the components of academic engagement. Taken together, these empirical findings illustrate that the experience of positive emotions is important for understanding the emergence of personal resources.

Psychological Capital

Based on B&B theory (Fredrikson, 1998) and Conservation of Resources (COR) theory (Hobfoll, 2002), Luthans & Youssef–Morgan (2017) refer to PsyCap as a positive personal resource. PsyCap is defined as an “individual’s positive psychological state of development characterized by: (1) having confidence (efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success” (Luthans, Youssef–Morgan & Avolio, 2015, p. 2). Although efficacy, optimism, hope, and resilience are conceptually distinct, these four components share common variance and are part of a synergistic set of resources consistent with the notion of *resource caravans* (Hobfoll, 2002). That is, these four components of PsyCap may “travel together” and interact synergistically to produce differentiated manifestations over time and across contexts (Luthans & Youssef–Morgan, 2017).

Although considerable research about PsyCap has been carried out in industrial–organizational settings, some scholars argue that there are strong theoretical reasons to propose that PsyCap could also play a key role in the educational context (Datu et al., 2016; Siu et al., 2014). In addition, it has been proposed that previous research about its individual components (i.e., efficacy, optimism, hope, and resilience) may differ from research on a higher–order construct such as PsyCap (Datu et al., 2016). In this regard, recent research has assessed PsyCap at pre–professional levels (i.e., high school and undergraduate university students), finding direct associations with academic performance (Datu et al., 2016; Liao & Liu, 2016; Vanno, Kaemkate & Wongwanich, 2014), intrinsic motivation (Siu et al., 2014), learning empowerment (Liao & Liu, 2016; You, 2016), study engagement (Datu & Valdez, 2016; Datu et al., 2016; Luthans et al., 2012; Siu et al., 2014; You, 2016), and student well–being (Datu & Valdez, 2016).

The Mediating Role of PsyCap Between Study-related Positive Emotions and Academic Performance

1
2 Previous research has shown that study-related emotions influence students' learning and achievement
3 (Villavicencio & Bernardo, 2012; 2013). As B&B theory predicts, the effect of positive emotions on academic
4 performance is mediated by cognitive-motivational variables (Pekrun, 1992; Pekrun, Goetz, Titz & Perry,
5 2002). Based on B&B theory, we propose that PsyCap (a cognitive-motivational variable) is fostered by study-
6 related positive emotions. This conjecture is supported, as mentioned above, by research that has demonstrated
7 the relevance of positive emotions in the prediction of different personal resources (Ouweneel et al., 2011;
8 Ouweneel et al., 2012; Salanova et al., 2011; Rogaten & Moneta, 2015; Xanthopoulou et al., 2012) and research
9 that identifies PsyCap as a predictor of academic performance (Datu et al., 2016; Liao & Liu, 2016; Vanno et
10 al., 2014). According to COR theory (Hobfoll, 1989), these results can be explained by the accumulation of
11 psychological resources, which may promote positive outcomes such as higher academic performance. In
12 addition, some research about individual components of PsyCap conducted in academic settings showed their
13 relevance in a variety of school-related variables (Bong, 2011; Gallagher, Marques & Lopez, 2016; Hoy, Tarter
14 & Hoy, 2006; Jiang, Song, Lee & Bong, 2014; Rand, Martin & Shea, 2011; Snyder et al., 2002).

15
16
17
18
19
20
21
22
23
24
25
26
27
28 In sum, the proposed mediation occurs because study-related positive emotions may facilitate the
29 building of PsyCap, and in turn, these "resource caravans" would foster academic performance.

Present Study

30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000

Method

Sample and Procedure

131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

procedure. Each student had a computer where the questionnaires were uploaded on a website especially designed for the research. Students took around 25 minutes to answer the questionnaire, and the data compilation took two weeks.

Measures

Study-related positive emotions were measured using six items corresponding to two scales of positive emotions, 3 items on low-activation and 3 items on high-activation, from the *Job-related Affective Well-being Scale* (Van Katwyk, Fox, Spector & Kelloway, 2000), adapted to the academic context. Students answered using a Likert-type scale with scores from 1 (*never*) to 5 (*always*), reflecting how they feel about their studies. The adaptation of the items from the labour context to the academic context consisted of rewording the original reference to the job context (for example, “my job makes me feel at ease”) to refer to the academic context (for example “my studies make me feel at ease”).

Psychological capital was measured using an adaptation of the *Psychological Capital Questionnaire* (Avey, Avolio & Luthans, 2011) to the academic context. This questionnaire has 12 items that measure the four dimensions of the PsyCap construct on a Likert-type scale with scores from 1 (*totally disagree*) to 6 (*totally agree*): (1) three items correspond to the efficacy dimension (e.g. “I feel sure when sharing information about my studies with other people”); (2) two items correspond to the optimism dimension (e.g. “Concerning my studies, I’m optimistic about what the future offers me”); (3) four items correspond to the hope dimension (e.g. “Right now I see myself as being pretty successful in my studies”); and (4) three items correspond to the resilience dimension (e.g. “I usually take the stressful aspects of my studies in stride”).

Academic performance was measured using the grade point average (GPA) provided by the educational institutions in two mandatory subjects in the Chilean education curriculum: maths and language/communication. The former includes content structured on four axes of evaluation: numbers, algebra, geometry, and data and probability. The latter includes contents structured on three axes of evaluation: oral communication, reading, and writing. According to the Chilean grading system, GPAs ranged from 1 (*poor*) to 7 (*excellent*). Both subjects are offered by semesters (March–June and July–November), with a total of six hours per week. For the objective of this study, the GPA was registered at the end of the semester before the data collection.

Data Analysis

Preliminary analysis included means, standard deviations, and bivariate correlations conducted by IBM SPSS Statistics 21.0 and the omega index (McDonald, 1999) by MPLUS 7.1. The subsequent analysis was performed with AMOS 21.0. First, to examine the common method variance bias, Harman’s single factor test

1 was used (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Second, a SEM analysis was conducted to find out
2 the structural relations in the hypothesized model (i.e., positive emotions → PsyCap → academic performance).
3
4 We used maximum likelihood estimation methods, and the input for each analysis was the covariance matrix of
5 the items. The goodness-of-fit of the model was evaluated using absolute and relative indexes: chi-square (χ^2)
6 and normed χ^2 , Root-Mean-Squared Error of Approximation (RMSEA) with a confidence interval (90%),
7
8 Incremental Fit Index (IFI), Comparative Fit Index (CFI), Standardized Root Mean Residual (SRMR), and
9 Akaike Information Criterion (AIC). To help evaluate the cut-off and determine model fit, we followed the
10 guidelines published by the European Journal of Psychological Assessment (EJPA; Schweizer, 2010) and
11 previous recommendations (Schreiber, Nora, Stage, Barlow & King, 2006). Third, we tested the statistical
12 significance of the indirect effects by computing the bias-corrected and accelerated method (BCa) around the
13 indirect effect obtained from a bootstrapping analysis. Finally, additional analysis was performed taking into
14 account gender and age as control variables and an alternative direction of the flow model (i.e., PsyCap →
15 positive emotions → academic performance); in addition, the mediating role of the PsyCap components takes
16 into account high and low activation of the study-related positive emotions.
17
18
19
20
21
22
23
24
25
26
27

28 **Results**

29 **Preliminary Analysis**

30 Table 1 shows means, standard deviations, the omega index, and correlational coefficients among the
31 variables. The internal consistencies obtained for the scales used was good, and the pattern of correlations
32 revealed significant direct relationships for all measures in this sample.
33
34
35
36
37

38 The results of Harman's single factor test (see Table 2, M1) obtained a fit index under the
39 recommended fit standards (Schreiber et al., 2006; Schweizer, 2010), which means that this bias is not likely to
40 affect the research data. Therefore, the variance in the variables may be due to the psychosocial constructs being
41 evaluated and not to the evaluation method.
42
43
44
45
46

47 INSERT TABLE 1 OVER HERE

48 **Structural Equation Modelling**

49 Study-related positive emotions, PsyCap, and academic performance are represented as latent variables
50 in the structural model (Figure 1). Specifically, study-related positive emotions have two indicators, i.e., high-
51 activation and low-activation; PsyCap has four indicators, i.e., efficacy, optimism, hope and resilience; and
52 academic performance has two indicators, i.e., maths performance and language/communication performance.
53
54
55
56
57
58
59
60
61
62
63
64
65

(Schreiber et al., 2006; Schweizer, 2010), explaining 57.2% of the PsyCap variance and 13.0% of the academic performance variance.

INSERT TABLE 2 OVER HERE

Mediation Analysis

Mediation involves a relationship in which an independent variable (X) impacts on a mediator (M), which, in turn, impacts on a dependent variable (Y). One can say that a relationship is mediated if: X is significantly related to M (testing for a); M is significantly related to Y after controlling for X (testing for b); and the indirect effect is statistically significant (testing for ab; MacKinnon, 2008). In addition, full mediation occurs when the introduction of the mediator M reduces the direct effect of X on Y to zero (i.e., non-significant direct effect), and partial mediation occurs when the introduction of the mediator M does not completely reduce the direct effect of X on Y (i.e., significant direct effect).

To examine the mediating role of PsyCap in our model (i.e., study-related positive emotions → PsyCap → academic performance), we implemented the bootstrapping procedure, one of the most valid and powerful methods for testing intervening variable effects (Williams & MacKinnon, 2008). By following Hayes' (2009) recommendations, 5000 new samples were taken from our sample, and indirect effects were calculated. The results of this analysis led us to conclude that: study-related positive emotions are significantly related to PsyCap; $a = .75$; $SE = .03$; 95% BCa CI [.69, .81]; PsyCap is significantly related to academic performance after controlling for study-related positive emotions: $b = .34$; $SE = .11$; 95% BCa CI [.08, .52]; study-related positive emotions are not significantly related to academic performance: $c = .02$; $SE = .12$; 95% BCa CI [-.21, .28]; and the indirect effect between study-related positive emotions and academic performance, via PsyCap, is statistically significant: $ab = .25$; $SE = .08$; 95% BCa CI [.06, .40]. Therefore, we can conclude that PsyCap fully mediates the relationship between study-related positive emotions and academic performance.

INSERT FIGURE 1 OVER HERE

Additional Analysis

As gender and age were significantly associated with study-related positive emotions and PsyCap, the analysis was performed again with these two control variables (see Table 2, M3). This did not alter the results, with minimal changes in parameter estimates and explained variance in academic performance, and indirect significant effect was confirmed ($ab = .28$; $SE = .04$; 95% BCa CI [.21, .36]).

In order to assess the plausibility of the reverse order (i.e., PsyCap → study-related positive emotions → academic performance), an alternative model was run in which PsyCap acted as the predictor of academic

performance, and study-related positive emotions were specified as the mediator. Results did not support this alternative model, as the indirect effect of PsyCap on academic performance through study-related positive emotions was not statistically significant ($ab = .01$; $SE = .09$; 95% BCa CI $[-.16, .21]$).

Subscale analysis of the study-related positive emotions revealed a significant indirect effect between high activation ($ab = .22$; $SE = .03$; 95% BCa CI $[.16, .28]$) and low activation ($ab = .28$; $SE = .03$; 95% BCa CI $[.21, .36]$) study-related positive emotions and academic performance via PsyCap. In addition, this significant indirect effect was found via each component of PsyCap: efficacy ($ab = .15$; $SE = .03$; 95% BCa CI $[.08, .23]$), optimism ($ab = .13$; $SE = .04$; 95% BCa CI $[.06, .22]$), hope ($ab = .33$; $SE = .03$; 95% BCa CI $[.28, .40]$), and resilience ($ab = .21$; $SE = .03$; 95% BCa CI $[.14, .28]$).

Discussion

The objective of this study is to study the mediating role of PsyCap in the relationship between study-related positive emotions and academic performance. This study makes an innovative contribution due to the scarce research about the antecedents of PsyCap in academic settings and the lack of previous reports related to the interactions among study-related positive emotions, PsyCap, and objective academic performance, as assessed by student's GPA.

Theoretical Contributions

First, we found that study-related positive emotions are directly associated with PsyCap. This means that students who experience a higher frequency of positive emotions in their studies, whether of high or low activation, are more likely to report high levels of PsyCap. This result is coherent with the B&B theory, which emphasizes the role of experiencing positive emotions in generating the development of new psychological resources (in our case, PsyCap), and the derived effects of experiencing positive emotions emerge regardless of their level of arousal (Fredrikson, 2003). In sum, our finding confirms that positive emotions are one of the key mechanisms through which PsyCap operates (Luthans & Youssef-Morgan, 2017).

Second, we found that PsyCap is directly associated with academic performance. This means that students who report higher levels of PsyCap are more likely to obtain high levels of academic performance (i.e. GPA). This result agrees with previous research in academic settings emphasizing the role of PsyCap in academic engagement, academic motivation, and academic performance (Datu et al., 2016; Liao & Liu, 2016; Vanno et al., 2014). In addition, subscale analysis showed that the PsyCap component that had the greatest effect on academic performance was hope. This result is consistent with previous studies that reported direct associations between hope and academic performance (Gallagher et al., 2016; Rand et al., 2011), and it might be

1 explained by the fact that high-hope students are attuned to their own goals, in control of how they will pursue
2 them, and intrinsically motivated (Conti, 2000; Snyder et al., 2002).

3
4 Third, we found that study-related positive emotions are indirectly associated with academic
5 performance via PsyCap. This result suggests that experiencing positive emotions (study-related in our
6 research) expands thinking and action tendencies, favouring the later building of personal resources (PsyCap in
7 our research) that would be used to face challenging or difficult situations in the academic context. Although
8 some authors have proposed that positive emotions mediate between academic performance and cognitive-
9 motivational variables (Pekrun, Elliot & Maier, 2009; Villavicencio, 2011; Villavicencio & Bernardo, 2012;
10 2013), our results did not support this alternative direction because the indirect effect of PsyCap on academic
11 performance via study-related positive emotions was not statistically significant. However, this alternative
12 direction has been explained by the B&B theory as the positivity-triggered upward spiral process. That is, initial
13 levels of positive emotions predicted later levels of positive emotions, partly through changes in personal
14 resources; likewise, initial levels of personal resources predicted later levels of personal resources, partly
15 through changes in positive emotions (Fredrikson, 2013; Fredrikson & Joiner, 2002; Salanova, Bakker &
16 Llorens, 2006).

17
18 Fourth, our results may also be explained by referring to the concept of mental capital (Kirkwood,
19 Bond, May, McKeith & The, 2008). This construct refers to the totality of a person's cognitive and emotional
20 resources. That is, mental capital reflects people's basic endowment and experiences that take place throughout
21 life. From this point of view, our results suggest that, in the formative years of mental capital, positive emotions
22 play an important role in building it up. More specifically, study-related positive emotions may serve to build
23 up certain behaviours included in the mental capital construct, such as flexibility and efficiency in learning, and
24 resilience or perseverance when faced with stress and failure. This is a significant result that complements the
25 current literature on possible ways to enhance mental capital, for example, by including the promotion of
26 emotional experiences in educational or positive youth development programmes (see Kirkwood et al., 2008).

27 **Practical Implications**

28
29 First, based on the role of positive emotions, teachers could generate a climate in their classroom that
30 promotes this experience. For example, among other alternatives, planning the path to success can be addressed.
31 It is possible to promote internal attributions about the achieved performance (Salanova, Martínez & Llorens,
32 2012); or training activities can be carried out, oriented toward continuous learning and avoiding failure, with an
33 appropriate attitude, and persevering when failure is present. Also, teachers can encourage students and provide
34

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

them with positive feedback, thereby stimulating positive emotions. This may, increase their personal resources, which promotes their well-being right away, and play a role in behavioral reinforcement. In addition, according to Deci & Ryan (2002), on seeing the effort from students in performing specific tasks or in learning, teachers could encourage them by satisfying their basic needs for autonomy, competence, and relatedness, which is likely to enhance the experience of study-related positive emotions and positive outcomes.

Second, a key feature of PsyCap is that it is state-like and open to development through instructional programs (Luthans & Youssef-Morgan, 2017). Thus, a PsyCap intervention (PCI) training model (Luthans, Avey, Avolio, Norman & Combs, 2006) has shown the possibility of developing PsyCap in working adults (Luthans, Avey & Patera, 2008) and undergraduate university students (Luthans, Avey, Avolio & Peterson, 2010). The PCI focuses on developing the four psychological resources of PsyCap using four groups of different techniques: a) acquiring and modifying self-efficacy beliefs; b) developing realistic, constructive, and accurate beliefs; c) designing goals, pathway generation, and strategies for overcoming obstacles; and d) asset factors, risk factors, and influence processes. Each of these four groups can be adapted for the development of students' PsyCap, which is likely to favour high levels of academic performance.

Limitations and Future Research

There are two major limitations in this research. First, this is a cross-sectional study, which keeps us from establishing the causality of the observed phenomenon. It is possible that students with higher levels of PsyCap would, at the same time, also experience study-related positive emotions more often; in the same way, having high academic performance can be the origin of the later emergence of PsyCap in students. However, we tested an alternative direction model (i.e., PsyCap → positive emotions → academic performance), and this possibility is unlikely in our sample. Additionally, our results agree with B&B theory (Fredrikson, 1998; 2001), specifically with the build hypothesis, which has been confirmed through longitudinal designs (Salanova et al., 2011; Ouweneel et al., 2011) and diary studies (Ouweneel et al., 2012; Xanthopoulou et al., 2012), suggesting causality. Second, we used self-report measures for emotions and PsyCap, which could have produced common method bias variance. However, to eliminate this possibility, we used Harman's single factor test. Results show that there is no single factor that explains the variance in the data. In addition, as an outcome variable, we included an objective measure of academic performance in our model, so that the menace of common method bias is unlikely.

The aforementioned limitations could be considered fruitful research lines in the future. First, the proposed model could be examined from a longitudinal approach. Furthermore, it would be important to add

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

other meaningful constructs such as school engagement and academic satisfaction. Along these lines, taking into account the circumplex model of emotions (Russel, 1980; Warr, 1994), school engagement and academic satisfaction can be directly associated with high-activation and low-activation positive emotions, respectively (Bakker & Oerlemands, 2011). Future research could add these constructs to PsyCap and examine their mediating role between study-related positive emotions and academic performance. Second, in addition to including objective measures of academic performance, it would be interesting to incorporate the teacher's perception of the students' positive emotions, personal resources, school engagement, and academic satisfaction. Moreover, teachers' own personal resources or engagement levels could be included in the model by examining their role in the positive emotions and personal resources of their students.

References

- Avey, J. B., Avolio, B. J., & Luthans, F. (2011). Experimentally analyzing the impact of leader positivity on follower positivity and performance. *The Leader Quarterly*, 22, 282–294. doi: 10.1016/j.leaqua.2011.02.004.
- Bakker, D. J., Lyons, S. T., & Conlon, P. D. (2017). An exploration of the relationship between psychological capital and depression among first-year doctor of veterinary medicine students. *Journal of Veterinary Medical Education*, 44, 50–62. doi: 10.3138/jvme.0116–006R.
- Bakker, A. B., & Oerlemans, W. (2011). Subjective well-being in organization. In K. S. Cameron & G. M. Spreitzer (eds), *The Oxford Handbook of Positive Organizational Scholarship* (pp. 178–189). New York: Oxford University press. doi: 10.1093/oxfordhb/9780199734610.013.0014.
- Bong, M. (2001). Role of self-efficacy and task-value in predicting college students' course performance and future enrolment intentions. *Contemporary Educational Psychology*, 26, 553–570. doi: 10.1006/ceps.2000.1048.
- Conti, R. (2000). College goals: Do self-determined and carefully considered goals predict intrinsic motivation, academic performance, and adjustment during the first semester? *Social Psychology of Education*, 4, 189–211. doi: 10.1023/A:1009607907509.
- Datu, J. A. D., King, R. B., & Valdez, J. P. (2016). Psychological capital bolsters motivation, engagement, and achievement: Cross-sectional and longitudinal studies. *The Journal of Positive Psychology*. doi: 10.1080/17439760.2016.1257056.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
- Datu, J. A. D., & Valdez, J. P. M. (2016). Psychological capital predicts academic engagement and well-being in Filipino high school students. *The Asia-Pacific Education Researcher*, 25(3), 399–405. doi: 10.1007/s40299-015-0254-1.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of Self-determination Research*. Rochester, NY: The University of Rochester Press.
- Fredrikson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300–319. doi: 10.1037/1089-2680.2.3.300.
- Fredrikson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. doi: 10.1037/0003-066X.56.3.218.
- Fredrikson, B. L. (2003). Positive emotions and upward spirals in organization. In K. Cameron, J. Dutton, & R. Quinn (Eds.), *Positive organizational scholarship*. (p.163–175). San Francisco, CA: Berrett-Koehler.
- Fredrikson, B. L. (2013). Positive emotions broaden and build. *Advances in Experimental Social Psychology*, 47, 1–53. doi: 10.1016/B978-0-12-407236-7.00001-2.
- Fredrikson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Journal of Personality and Social Psychology*, 65, 45–55. doi: 10.1111/1467-9280.00431.
- Fredrikson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crises? A prospective study on resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality & Social Psychology*, 84, 365–376. doi: 10.1037/0022-3514.84.2.365.
- Gallagher, M. W., Marques, S. C., & Lopez, S. J. (2016). Hope and the academic trajectory of college students. *Journal of Happiness Studies*. doi: 10.1007/s10902-016-9727-z.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44, 513–524. doi: 10.1037/0003-066X.44.3.513.
- Hayes, A. F. (2009). Beyond baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408–420. doi: 10.1080/03637750903310360.
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology*, 6(4), 307–324. doi: 10.1037//1089-2680.6.4.307.
- Hoy, A. W., Tarter, C. J., & Hoy, W. K. (2006). Academic optimism of schools: A force student achievement. *American Education Research Journal*, 43, 425–446. doi: 10.1016/j.sbspro.2010.12.261.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
- Jiang, Y., Song, J., Lee, M., & Bong, M. (2014). Self-efficacy and achievement goals as motivational links between perceived contexts and achievement. *Educational Psychology, 34*, 92–117. doi: 10.1080/01443410.2013.863831.
- Kirkwood, T., Bond, J., May, C., McKeith, I., & The, M. (2008). Foresight Mental Capital Wellbeing Project. Mental capital through life: Future challenges. The Government Office for Science, London.
- Liao, R. & Liu, Y. (2016). The impact of structural empowerment and psychological capital on competence among Chinese baccalaureate nursing students: A questionnaire survey. *Nurse Education Today, 36*, 31–36. doi: 10.1016/j.nedt.2015.07.003.
- Liu, C., Zhao, Y., Tian, X., Zou, G., & Li, P. (2015). Negative life events and school adjustment among Chinese nursing students: The mediating role of psychological capital. *Nurse Education Today, 35*(6), 754–759. doi: 10.1016/j.nedt.2015.02.002.
- Luthans, F., Avey, J. B., Avolio, B. J., Norman, S. M., & Combs, G. M. (2006). Psychological capital development: Toward a micro-intervention. *Journal of Organizational Behaviour, 27*, 387–393. doi: 10.1002/job.373.
- Luthans, F., Avey, J. B., Avolio, B. J., & Peterson, S. (2010). The development and resulting performance impact of positive psychological capital. *Human Resources Development Quarterly, 21*, 41–66. doi: 10.1002/hrdq.20034.
- Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a web-based training intervention to develop positive psychological capital. *Academy of Management Learning & Education, 7*(2), 209–221. doi: 10.5465/AMLE.2008.32712618.
- Luthans, B. C., Luthans, K. W., & Jensen, S. M. (2012). The impact of business school students' psychological capital on academic performance. *Journal of Education for Business, 87*, 253–259. doi: 10.1080/08832323.2011.609844.
- Luthans, F., & Youssef-Morgan, C. M. (2017). Psychological capital: An evidence-based positive approach. *Annual Review of Organizational Psychology and Organizational Behaviour*. doi: 10.1146/annurev-orgpsych-032516-113324.
- Luthans, F., Youssef-Morgan, C. M., & Avolio, B. (2015). *Psychological Capital and Beyond*. New York: Oxford University Press.
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*(6), 803–855. doi: 10.1037/0033-2909.131.6.803.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

McDonald, R. P. (1999). *Test theory: A unified treatment*. Mahwah, NJ: Erlbaum.

Mauss, I. B., Shallcross, A. J., Troy, J., John, O., Ferrer, E., Wilhelm, F., & Gross, J. J. (2011). Don't hide your happiness! Positive emotion dissociation, social connectedness, and psychological functioning. *Journal of Personality and Social Psychology, 100*(4), 738–748. doi: 10.1037/a0022410.

Ouweneel, E., Le Blanc, P. M., & Schaufeli, W. B. (2011). Flourishing students: A longitudinal study on positive emotions, personal resources and study engagement. *The Journal of Positive Psychology, 6*(2), 142–153. doi: 10.1080/17439760.2011.558847.

Ouweneel, E., Le Blanc, P. M., Schaufeli, W. B., & van Wijhe, C. I. (2012). Good morning, good day: A diary study on positive emotions, hope and work engagement. *Human Relations, 65*(9), 1129–1154. doi: 10.1177/0018726711429382.

Pekrun, R. (1992). The impact of emotions on learning and achievement: Towards a theory of cognitive/motivational mediators. *Applied Psychology: An International Review, 41*(4), 359–376. doi: 10.1111/j.1464-0597.1992.tb00712.x.

Pekrun, R., Elliot, A. J., & Maier, M. A. (2009). Achievement goals and achievement emotions: testing a model of their joint relations with academic performance. *Journal of Educational Psychology, 101*, 115–135. doi: 10.1037/a0013383.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist, 37*(2), 91–105. doi: 10.1207/s15326985ep3702_4.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88* (5), 879–903. doi: 10.1037/0021-9010.88.5.879.

Rand, K. L., Martin, A. D., & Shea, A. M. (2011). Hope, but not optimism, predicts academic performance of law students beyond previous academic achievement. *Journal of Research in Personality, 45*, 683–686. doi: 10.1016/j.jrp.2011.08.004.

Riulli, L., Savicki, V., & Richards, J. (2012). Psychological capital buffer to student stress. *Psychology, 3*(12), 1202–1207. doi: 10.4236/psych.2012.312A178.

Rogaten, J., & Moneta, G. B. (2015). Use of creative cognition and positive affect in studying: Evidence of a reciprocal relationship. *Creativity Research Journal, 27*(2), 225–231. doi: 10.1080/10400419.2015.1030312.

- 1
2
3
4 Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, 39, 1161–
5 1178. doi: 10.1037/h0077714.
6
7 Salanova, M., Bakker, A. B., & Llorens, S. (2006). Flow at work: Evidence for an upward spiral of
8 personal and organizational resources. *Journal of Happiness Studies*, 7, 1–22. doi: 10.1007/s10902–
9 005–8854–8.
10 Salanova, M., Llorens, S., & Schaufeli, W. B. (2011). “Yes, I can, I feel good, and I just do it!” On gain cycles
11 and spirals of efficacy beliefs, affect and engagement. *Applied Psychology: An International Review*,
12 60(2), 255–285. doi: 10.1111/j.1464-0597.2010.00435.x.
13
14 Salanova, M., Martínez, I., & Llorens, S. (2012). Success breeds success, especially when self–efficacy is
15 related with an internal attribution of causality. *Studies In Psychology*, 33(2), 151–165. doi:
16 10.1174/021093912800676420.
17
18 Schreiber, J. B., Nora, A., Stage, F. K. Barlow, E., & King, J. (2006). Reporting structural equation modeling
19 and confirmatory factor analysis results: A review. *The Journal of Educational research*, 99(6), 323–
20 338. doi: 10.3200/JOER.99.6.323-338.
21
22 Schweizer, K. (2010). Some guidelines concerning the modelling of traits and abilities in test construction.
23 *European Journal of Psychological Assessment*, 26, 1–2. doi: 10.1027/1015–5759/a000001.
24
25 Seligman, M. E. P., Ernst, R. M., Gillham, J. Reivich, K., & Linkins, M. (2009). Positive education: Positive
26 psychology and classroom interventions. *Oxford Review of Education*, 35(3), 293–311. doi:
27 10.1080/03054980902934563.
28
29 Siu, O. L., Bakker, A. B., & Jiang, X. (2014). Psychological capital among university students: Relationship
30 with study engagement and intrinsic motivation. *Journal of Happiness Studies*, 15, 979–994. doi:
31 10.1007/s10902–013–9459–2.
32
33 Snyder, C. R., Shorey, H. S., Cheavens, J., Pulvers, K. M., Adams, V. H., & Wiklund, C. (2002). Hope and
34 academic success in college. *Journal of Educational Psychology*, 94(4), 820–826. doi: 10.1037/0022–
35 0663.94.4.820.
36
37 Stiglbauer, B., Gnambs, T. Gamsjäger, M., & Batinic, B. (2013). The upward spiral of adolescents’ positive
38 school experiences and happiness: Investigating reciprocal effects over time. *Journal of School*
39 *Psychology*, 51(2), 231–242. doi: 10.1016/j.jsp.2012.12.002.
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
- Vanno, V., Kaemkate, W., & Wongwanich, S. (2014). Relationships between academic performance, perceived group psychological capital and positive psychological capital of Thai undergraduate students. *Social and Behavioral Sciences, 116*, 3226–3230. doi: 10.1016/j.sbspro.2014.01.739.
- Van Katwyk, P. T., Fox, S., Spector, P. E., & Kelloway, E. K. (2000). Using the job-related affective well-being scale (JAWS) to investigate affective responses to work stressors. *Journal of Occupational Health Psychology, 5*(2), 219–230. doi: 10.1037/1076-8998.5.2.219.
- Villavicencio, F. T. (2011). Critical thinking, negative academic emotions and achievement: A mediational analysis. *The Asia-Pacific Education Researcher, 20*, 118–126.
- Villavicencio, F. T., & Bernardo, A. B. I. (2012). Positive academic emotions moderate the relationship between self-regulation and academic achievement. *British Journal of Educational Psychology, 83*, 329–340. doi: 10.1111/j.2044-8279.2012.02064.x.
- Villavicencio, F. T., & Bernardo, A. B. I. (2013). Negative emotions moderate the relationship between self-efficacy and achievement of Filipino students. *Psychological Studies, 58*(3), 225–232. doi: 10.1007/s12646-013-0193-y.
- Warr, P. (1994). A conceptual framework for the study of work and mental health. *Work & Stress, 8*, 84–97. doi: 10.1080/02678379408259982.
- Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling, 15*, 23–51. doi: 10.1080/10705510701758166.
- You, J. (2016). The relationship among college student's psychological capital, learning empowerment, and engagement. *Learning and Individual Differences, 49*, 17–24. doi: 10.1016/j.lindif.2016.05.001.
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2012). A diary study on the happy worker: How job resources relate to positive emotions and personal resources. *European Journal of Work and Organizational Psychology, 21*(4), 489–517. doi: 10.1080/1359432X.2011.584386.

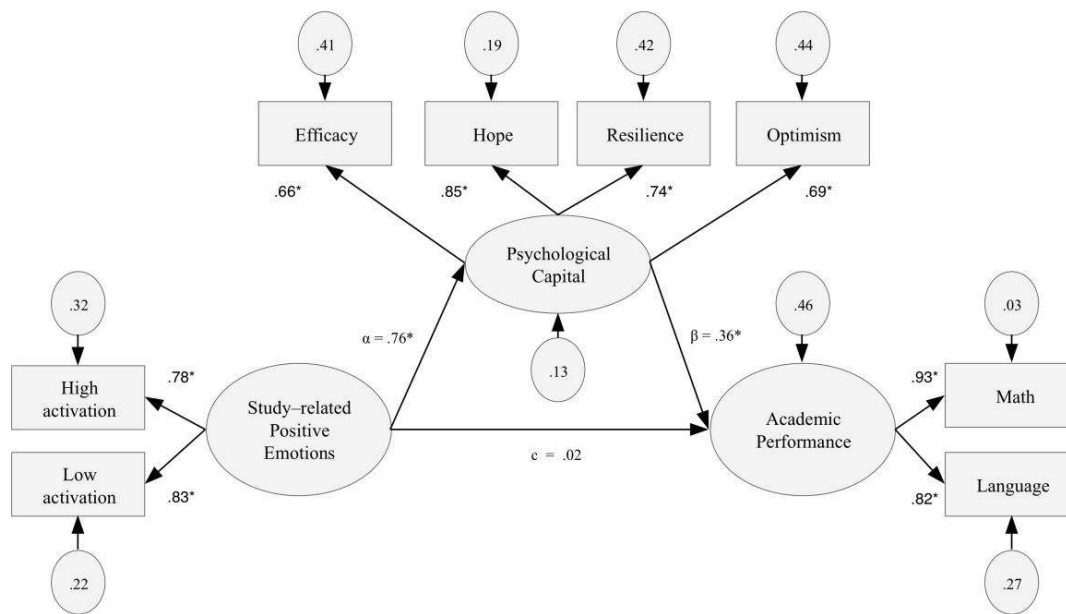


Figure 1
 Simple mediation model showing the effect of study-related positive emotions on academic performance through psychological capital. Standardized coefficients are presented. $* = p < .001$. Indirect effect (ab) = $.25^*$.

Running Head: POSITIVE EMOTIONS, PSYCHOLOGICAL CAPITAL AND ACADEMIC PERFORMANCE

Table 1

Means, Standard Deviation, Omega Index and Correlations for the study variables (n = 639)

	M	SD	Ω	1	2	3	4	5	6	7	8	9	10
1. Positive emotions	3.08	.79	.84	-									
2. High activation	3.05	.90	.83	.91*	-								
3. Low activation	3.11	.84	.69	.90*	.64*	-							
4. Psychological capital	3.65	.72	.87	.60*	.53*	.56*	-						
5. Efficacy	3.73	.85	.71	.45*	.40*	.41*	.76*	-					
6. Hope	3.57	.83	.77	.57*	.50*	.54*	.83*	.55*	-				
7. Resilience	3.52	.90	.67	.42*	.35*	.41*	.80*	.46*	.58*	-			
8. Optimism	3.79	.98	.73	.50*	.46*	.45*	.83*	.50*	.61*	.55*	-		
9. Performance 1 ¹	5.13	.90	-	.20*	.13*	.24*	.26*	.15*	.32*	.25*	.15*	-	
10. Performance 2 ²	5.82	.52	-	.24*	.17*	.27*	.23*	.13*	.29*	.24*	.09*	.72*	-

Notes: * = $p < .001$; ¹ = mathematics subject; ² = language/communication subject.

Table 2
Results from SEM analysis (n = 639)

	χ^2	<i>df</i>	χ^2/df	IFI	CFI	RMSEA	90% CI RMSEA	SRMR	AIC
M1 Harman's single factor test	248.51*	20	12.42	.86	.86	.13	[.11, .14]	.07	280.51
M2 Proposed model	93.23*	17	5.48	.96	.96	.08	[.06, .10]	.04	147.23
M3 Gender and age controlled	173.42*	29	5.98	.94	.94	.08	[.07, .10]	.05	249.19

Notes: * = $p < .001$; χ^2 = Chi-square; *df* = degree of freedom; IFI = Incremental Fit Index; CFI = Comparative Fit Index
RMSEA = Root Mean Square Error of Approximation; CI: confidence interval; SRMR = Standardized Root Mean Square Residual; AIC = Akaike Information Criterion.