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Positive Emotions, Autonomy Support and Academic Performance of University Students: The Mediating Role of Academic Engagement and Self-Efficacy

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Abstract

The overall objective of this study is to prove whether some variables such as autonomy support and positive affect experienced in the classroom are predictors of academic performance through self-efficacy and engagement in university students. The tested model confirms the expected results but notes that self-efficacy does not shown a significant direct effect on performance. Therefore, a second model is tested. We include self-efficacy as a predictor of academic engagement, eliminating the direct effect of this variable on performance. The results show a greater adjustment in the second model, so that (1) positive emotions and autonomy support predict academic performance, self-efficacy and academic engagement (2) self-efficacy predicts higher levels of academic engagement and the latter improves academic performance 3) indirect effects also show the existence of a mediation of these variables on the predictive relationship of autonomy support and positive emotions on performance.

Keywords: positive emotions, self-efficacy, academic engagement, academic performance.

Resumen

El objetivo general de este estudio es comprobar si variables como el clima de autonomía y las emociones positivas experimentadas en el aula son predictores del rendimiento académico a través de la autoeficacia y el compromiso académico en estudiantes universitarios. El modelo testado corrobora los resultados esperados, pero se observa que la autoeficacia no muestra un efecto directo significativo sobre el rendimiento. Por esta razón, se testa un segundo modelo, tomando la autoconfianza como predictor del compromiso académico, eliminando el efecto directo de esta variable sobre el rendimiento. Los resultados muestran un mayor ajuste en el segundo modelo, por lo que se concluye: (1) emociones positivas y apoyo a la autonomía predicen el rendimiento académico y también autoeficacia y compromiso académico; (2) autoeficacia predice mayores niveles de compromiso académico y el compromiso mejora el rendimiento; 3) El efecto indirecto muestra, además, que existe una mediación de estas variables en la relación predictiva de apoyo a la autonomía y emociones positivas sobre el rendimiento.

Palabras clave: emociones positivas, autoeficacia, compromiso académico, rendimiento académico.

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Introduction

Over the last years, there has been an increase in literature referring to students' emotional experiences in academic settings, due to the widespread influence of emotional experiences on learning processes and performance (Pekrun & Perry, 2014). The incorporation of emotional variables and their interaction with cognitive and performance variables is facilitating the understanding of teaching-learning processes in the academic area and, thus, carrying out more of these studies becomes fundamental (Christenson, Reschly, & Wylie, 2012).

Besides students, one of the key agents in all these processes are teacher bodies, who are responsible, in many cases, for the activation of emotions within the classroom, which arouse from teachers own goals, expectations and beliefs (Schutz & Mikyoung, 2014; Schutz & Zembylas, 2011).

Positive academic emotions

Fredrickson's theoretical model (1998, 2001) appears important to the study of positive emotions. This model explicates the importance of experiencing positive emotions to strengthen physical, intellectual, psychological and social resources in order to deal with future adverse situations or crises. According to this model, positive emotions would allow generating long-lasting and stable personal resources (Fredrickson, 2000). Albeit the existence of different types of positive emotions Fredrickson (2009) considers relevant to assess globally whether there is a predominance of positive affectivity (a set of positive emotions) in individuals, fact that would allow them to be more receptive, creative and flexible.

In recent years, there has also been an increase of studies concerned with the benefits of positive emotions, specifically for students in academic settings (e.g. Pekrun, 2006¸ 2009). This type of emotions has been regarded as academic emotions (e.g. studying), since they are related to activities carried out in educational institutions or to academic results (e.g. success and failure) (Pekrun, 2006, 2009). Some of these studies have shown that experiencing positive emotions such as happiness, hope or pride facilitates the development of self-regulated learning strategies, greater efforts and more academic achievements from students (Pekrun, Goetz, Titz, & Perry, 2002). Certainly, experiencing positive emotions in the classroom allows students to enjoy the learning process and to draw their attention to it (Campos, Frankel, & Camras, 2004; Davey, Day, & Howells, 2005; Paoloni, 2014).

Teacher-provided autonomy support

Regarding the variables predicting academic performance, the role of teachers has been extensively debated. For a long time, several studies recommended avoiding pedagogical practices influencing academic performance through rewards, because – among other aspects- they may promote manipulation from students, reduce the value of the knowledge gained and minimize academic engagement in tasks with no reward (Skinner, Williams, & Neddenriep, 2004). Nowadays, however, there is an increase in literature on the importance of affective relationships between teacher and student bodies, especially on the autonomy support based relationships promoted by teachers (Jang, Reeve, & Deci, 2010).

The concept of autonomy support is based on Deci & Ryan'a tenets (1985), who consider that, in this relationships, teachers acknowledge students' feelings and provide them relevant information and different choices to resolve their problems in their way, minimizing pressure and demands. In the same vein, some studies point out that teachers are capable of generating these positive educational and developmental results, since they find ways to involve and satisfy students' psychological needs (for autonomy, competence and relationships) during instruction (Reeve & Jang, 2006; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). Likewise, several studies show the multiple benefits of teacher-student relationships based on autonomy support, which include deeper levels of learning, positive affect, achievement and behavior persistence (Buff, Reusser, Rakoczy, & Pauli, 2011; Reeve, 2009).

Academic self-efficacy

According to Bandura (1977), self-efficacy is a judgement of competence that people use to perform a task successfully and that involves objectives, conducts and environmental conditions. Self-efficacy is fundamental for students to judge positively their own capacities and meet the requirements of the academic setting (Torre, 2007). Therefore, academic self-efficacy is related to the capacities of students to identify environment opportunities and obstacles, without diminishing engagement and motivation. By means of this, it is possible to distinguish between those that judge themselves as capable of controlling their environment and perceive the task as a challenge, and those who doubt about their capacities and desist before the first obstacle (Pajares, 2006; Salanova, Schaufeli, Martínez, & Bresó, 2010).

Studies such as Salanova, Lorente, Chambel & Martínez's (2011) confirm this idea, as they show that efficacy beliefs influence performance and participation in activities and, thus, academic engagement. Furthermore, it must be noted that self-efficacy not only helps to assume and make the efforts necessary to perform successfully tasks of varied nature, but also provides more personal resources to achieve good academic performance (Sweetman & Luthans, 2010; Whannell, Whannell, & Allen, 2012).

Academic engagement

Over the years, the concept of engagement- traditionally applied in the work sphere- has attained importance within the studies related to students' academic performance (Schaufeli, Salanova, González-Romá, & Bakker, 2002). In studies in Spanish, engagement has been translated as psychological bond (Salanova, Martínez, Bresó, Llorens, & Grau, 2005), school involvement (González-Fernández, Paoloni, Rinaudo, & Donólo, 2013) or academic engagement (Extremera, Durán, & Rey, 2007; Parra, 2010). According to Parra and Pérez (2010), academic engagement is understood as a tridimensional psychological well-being state (stamina, absorption, and dedication) of intrinsic commitment to studies. From this perspective, academic engagement is construed as a positive motivational construct, resulting from the boom of Positive Psychology in the last years (Parra, 2010).

Some studies emphasize the influence of academic engagement on performance, variables that have been proven to have a positive relation. In fact, it is posited that

students committed to their studies success, since –compared to the total number of exams- they show a higher pass rate (Parra, 2010). Therefore, studies such as Manzano (2004), Extremera et al. (2007), and Salanova et al.'s (2010), amongst others, have demonstrated that good results in academic performance are closely related to commitment to study. For example, Salanova et al.'s (2010) study concludes that the higher academic success was, the more self-efficacy beliefs were present, which, in turn yields higher levels of present stamina and dedication in relation to studies (academic engagement) and higher performance in future. These results also reveal that self-efficacy becomes a significant variable to consider within the factors that impact positively on academic engagement and performance.

Present study

This study proposes that positive emotions experienced in the classroom, together with student teacher relationships based on autonomy support are predictors of academic performance in non-university students. Nevertheless, in this relation, some other variables such as academic engagement and self-confidence intervene as mediators.

Firstly, it should be noted that experiencing positive emotions in the classroom has been related to motivation to task (Campos et al., 2004; Davey et al., 2005) and to a greater acquisition of learning strategies and self-regulation, which is not the case for experiences perceived as negative (D'Mello & Graesser, 2012). Thus, the model considers that positive emotions experienced in the classroom will be predictors of self-efficacy and academic engagement. This may also be applied to teachers' autonomy support, since, according to Williams, Saizow, Ross and Deci's (1997) tenets, it allows students to actively participate in their own learning processes, and improves their self-efficacy in academic work. In the same line, some previous studies demonstrated that autonomy support is linked to greater concentration in class (Standage, Duda, & Ntoumanis, 2005) and greater academic effort (Ntoumanis, 2010). This suggests that autonomy support will be predictor, along with positive emotions, of academic engagement and self-efficacy.

Finally, prior research has also shown the influence of self-efficacy and academic engagement on academic performance, and, thus, both are considered mediators in this model. Furthermore, several studies positively associate high levels of engagement with adequate academic performance (Ainley & Ainley, 2011; Jang, 2008; Parra, 2010). Self-efficacy also appears to be the personal resource that most predicts performance (Robbins et al., 2004), since- in general- students with higher levels of self-efficacy exert themselves double to achieve their goals and seek success despite difficulties.

Hypothesis

According to the above mentioned, it is expected positive emotions in the classroom and autonomy support to show a predictor effect on academic performance through academic engagement and self-efficacy. Specifically, we expect (1) positive emotions and teachers' autonomy support to predict self-efficacy and academic engagement; (2) Self-efficacy and academic engagement to predict academic performance; (3) Positive emotions and autonomy support to predict academic performance; and (4) IVs and DV indirect effect through mediators to be significant.

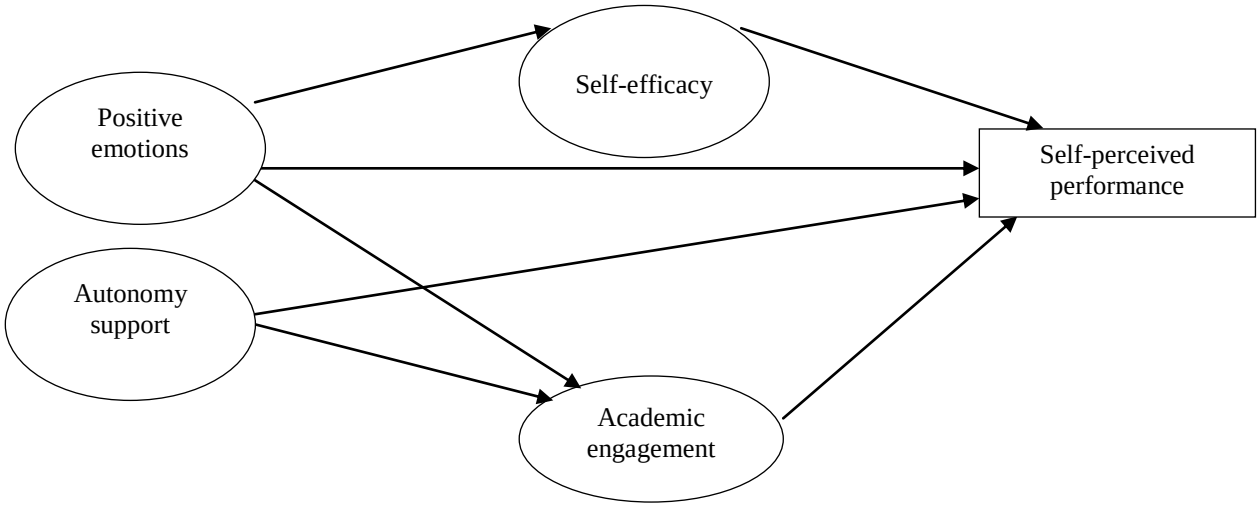

Figure 1. Hypothetical structural equation model.

Method

Participants

A convenience sample was used, as researchers consider it readily available. The sample was made up of students from three Chilean universities: Universidad Autónoma de Chile, Talca (25.5%) and Santiago (36.7%) premises, Universidad de Talca (33.2%) and Universidad Católica del Maule (14.6%). In total, the sample was composed of N = 428 university students, 36.5% of men and 63.5% of women between 18 and 45 years (M = 20.37 SD = 2.71).

Instruments

In instruments referring to emotions, autonomy support and self-perceived academic performance, questions regarding the overall mean obtained out of the sum of all subjects studied during the previous semester were asked, taking into account that the application of the questionnaire was carried out the first week of the new semester and, thus, students have just received their grades. The other two questionnaires were considered dispositional measures and were asked in less detail.

Academic engagement. A brief version (9 items) of Utrech's *Work Engagement Scale for Students* (UWESS- 9), elaborated by Schaufeli & Bakker (2003), adapted and validated in Chile by Parra and Pérez (2010). The scale shows nine statements of stamina, absorption and dedication before studies. An example item is: "I feel strong and vigorous when I'm studying or going to class", for which students should respond based on the frequency of occurrence of this in time, using one out of six Likert-type alternatives (0 = Never, 1 = A few times a year, 2 = Once a month or less, 3 = A few times a month, 4 = Once a week, 5 = A few times a week, 6 = Every day). For this study, internal consistency measured by Cronbach's alpha was .89, while McDonald's omega was .91. Composite reliability index was .90 and average variance extracted was above .50 (VME = 69.32 %).

Academic self-efficacy beliefs. This variable was measured by the Maslach Burnout Inventory – Student Survey's Perceived Competence Scale (MBI-SS; Schaufeli et al., 2002). This domain of the scale was composed by 8 items. An example item is: "In my opinion, I'm a good student" (0 = never to 6 = always). Reliability for this study was .90 and McDonald's omega was .92 with VME = 74.11 %. The composite reliability index for this scale was .92.

Autonomy support. The original version of Williams and Deci's (1996) LQC, based on the *Health-Care Climate Questionnaire* (Williams, Grow, Freedman, Ryan, & Deci 1996) was used. This questionnaire is made up of 15 items that measure teacher-provided autonomy support using one dimension: *Autonomy support.* An example item is: *'I feel understood by my instructor'.* Students were asked about autonomy support received from teachers in the previous semester. Answers are collected by a 7-point Likert scale, which ranges from 'not true at all' (1) to 'absolutely true'. Cronbach's alpha for this study was .84 and McDonald's omega was .86. The composite reliability index was also high .82 and VME was 61.76%.

Emotionality scale. Fredrickson (2009) developed a theory and a scale on positive emotions. This scale contains 10 adjectives describing each emotion in different intensity levels with a scale of 5 grades in which 0 = nothing and 4 = a lot. Students are asked to respond this scale taking into account whether they experienced these emotions frequently in previous semesters or not. The mean of the scores provides an overall assessment of the experienced positive affect (Fredrickson, 2009). An example item is: *'How happy, satisfied or pleased have you felt?* Reliability for this scale in the study was satisfactory, with Cronbach's alpha .83 and McDonald's omega .84. Composite reliability was also high (CR = .85) and VME above .50 (VME = 58.79%).

Self-perceived academic performance. Academic performance is measured by a scale created ad-hoc, in which teachers are asked to mark in a line ranging from 1 to 7 (Chilean grading scale) the mean obtained from the sum of all subjects studied in the semester just finished.

Procedure

Universities were asked for consent to administer the questionnaires and the own researchers were in charge of explaining the study objectives to the students, whose participation was voluntary and in their respective classrooms at university. Students were provided with a folder containing all the questionnaires and an informed consent to participate in the study. Besides the questionnaires detailed in the Instruments section, sociodemographic data such as gender and age was also enquired. The approximated duration of the procedure was 25 minutes.

Data analysis

First, descriptive analysis and bivariate correlations were carried out using the statistical package SPSS 21.0. Confirmatory factor analysis and structural equation models were conducted using AMOS 20.0. A measurement model was assessed first and, then, a structural equation model. The models were analyzed supposing a multivariate normal distribution, since the sample was numerous enough and asymmetry values and kurtosis of all variables were less than |2| for symmetry and, less than |7| for kurtosis (see Table 1). Values above .80 were also observed for each variable in KMO test and, thus, may be considered satisfactory.

Models were tested by the maximum likelihood estimation, along with the bias-corrected confidence interval bootstrap test. This procedure provides a mean of the estimations obtained from samples obtained in the bootstrap and standard deviation. Confidence intervals of the regression loads and standardized regression loads show that the estimate values are significantly different from zero, considering that lack of normality does not affect estimations (Byrne, 2001).

Byrne's indications (2001) were considered for all the models adjustment. Byrnes proposes taking into account absolute fit indices such as χ^2 –which should not be significant, despite its dependence on the sample size and subsequent difficulty for adjustment—,the ratio χ^2/df –considered acceptable when its values are below 5 –and the *Root Mean Square Error of Approximation*. Regarding the latter index, Browne & Cudeck (1993) suggest that values below .08 indicate an acceptable fit, while values of .05 or below indicate a good model fit. On the other hand, values below .08 are preferable for SRMR (Hu & Bentler, 1999), and it is also recommended using relative fit indices such as *Normed Fit Index*, *Comparative Fit Index* and *Incremental Fit Index*. As for the relative adjustment indices, values superior to .90 indicate an acceptable model fit, while values of .95 or above represent a good model fit (Hu & Bentler, 1999).

Results

Descriptive statistics of the studied variables may be seen in Table 1. The variables, grouped according to their measuring instrument- present moderate and uniform values. In addition, correlation indexes between variables are direct, positive and significant, as expected. Furthermore, an interesting correlation value may be observed between Academic Engagement and Self-efficacy.

Table 1

Descriptive Statistics and Correlations Between this Study Variables

Variable	*M*	*SD*	*Range*	*Asym.*	Kurt.	1.	2.	3.	4.	5
1. Positive emotions	2.06	.50	0-4	.76	1.03	--				
2. Autonomy support	3.08	.98	1-7	.1.23	.2.67	.35**	--			
3. Self-efficacy	4.45	.97	0-6	-.86	-.17	.38**	.33**	--		
4. Academic Engagement	3.98	1.09	0-6	-.23	.56	.37**	.37**	.55***	--	
5. Performance	4.15	1.70	1-7	-.45	.1.30	.25**	.31**	.27**	.34**	--

*p < .05. **p < .01. ***p < .001 (bilateral)

Measurement model

A measurement model was carried out to give construct validity to the instruments used and, subsequently, conduct a structural equation model. The obtained indices showed an adequate model fit, $\chi2 = 265.40$, $p < .001$, $\chi2/df = 3.8$, NFI = .92, CFI = .90,

IFI = .90, RMSEA = .07, and SRMR = .04. However, in the item 10 of the positive emotions questionnaire the weight is below .30, whereas in the rest of the items weighs are above .40. Consequently, the item was eliminated to improve the model fit and the adequacy of the instrument in the structural model. Once the item was eliminated, results showed a slightly better model fit 190.27, $p < .000$, $\chi 2/df = 2.81$, NFI = .92, CFI = .92, IFI = .91, RMSEA = .07, and SRMR = .03.

Structural equation model

Once the measurement model was computed, a structural equation model was carried out. Indirect effects were calculated using bias-corrected confidence interval bootstrap test in order to compute the structural model considering the variables mediation. According to different authors, bootstrapping is one of the most important methods to test the effect of the variables intervening (MacKinnon, Lockwood, & Williams, 2004; MacKinnon, 2008). In addition, according to Hayes (2009), the existence of direct effects on the variables is unnecessary, while the existence of an indirect effect is what matters to determine mediation. Therefore, models are calculated directly considering all variables and mediation is determined by observation of indirect effects.

In this model, self-efficacy and academic engagement were used as mediators of the relation between autonomy, positive emotions and self-perceived academic performance. Autonomy support and positive emotions showed a significant total effect on performance. When mediators were included, indirect effects between autonomy support climate and performance ($p < .01$) and between positive emotions experienced in the classroom ($p < .01$) and performance were observed. In positive emotions, a total mediation effect occurred, since positive emotions relation with performance stops being significant. However, mediation was partial between autonomy and performance. It may be also seen that predictor variables and mediators explain 21% of performance variance (see Figure 2).

This model presented an adequate fit $\chi 2 = 253.319$, $p < .001$, $\chi 2/df = 3.1$, NFI = .93, CFI = .93, IFI = .92, RMSEA = .07, and SRMR = .06. Nevertheless, it should be observed that self-efficacy was not significantly related to performance and including it did not give more statistical weigh to the total explained variance.

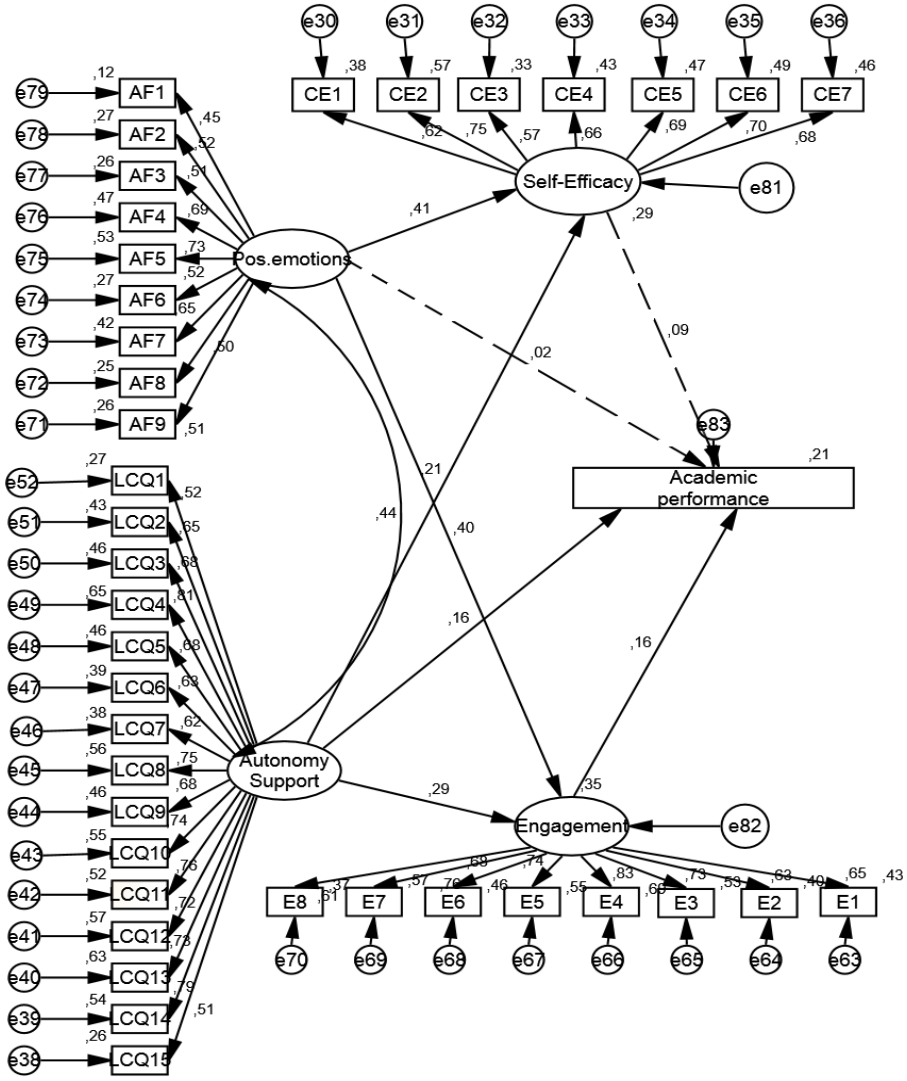

Figure 2. Structural equation model with multiple mediation (standardized parameters).

Consequently, it was preferred to test a second model in which self-efficacy was not directly related to self-perceived academic performance, albeit it did not predict academic engagement. It must be noted that this change in the model has a theoretical basis, which is further explained in the discussion section.

The second model showed a better fit tan the first one $\chi 2$ = 215.892, p < .001, $\chi 2/df$ = 2.8, NFI = .94, CFI = .93, IFI = .94, RMSEA = .06, and SRMR = .05, even when the weigh in the total explained variance of academic performance remains 21% after the changes in the variables relation. Positive emotions indirect effects on academic engagement by self-efficacy (p < .01), as well as the indirect effect of autonomy support and academic engagement (p < .01) are significant. In both cases, the mediating effect is partial. Positive emotions indirect effects on performance through these mediators are significant in this model (p < .001), showing a total effect in mediation. On the other hand, autonomy support indirect effects on performance are also significant and mediation was partial (p < .01).

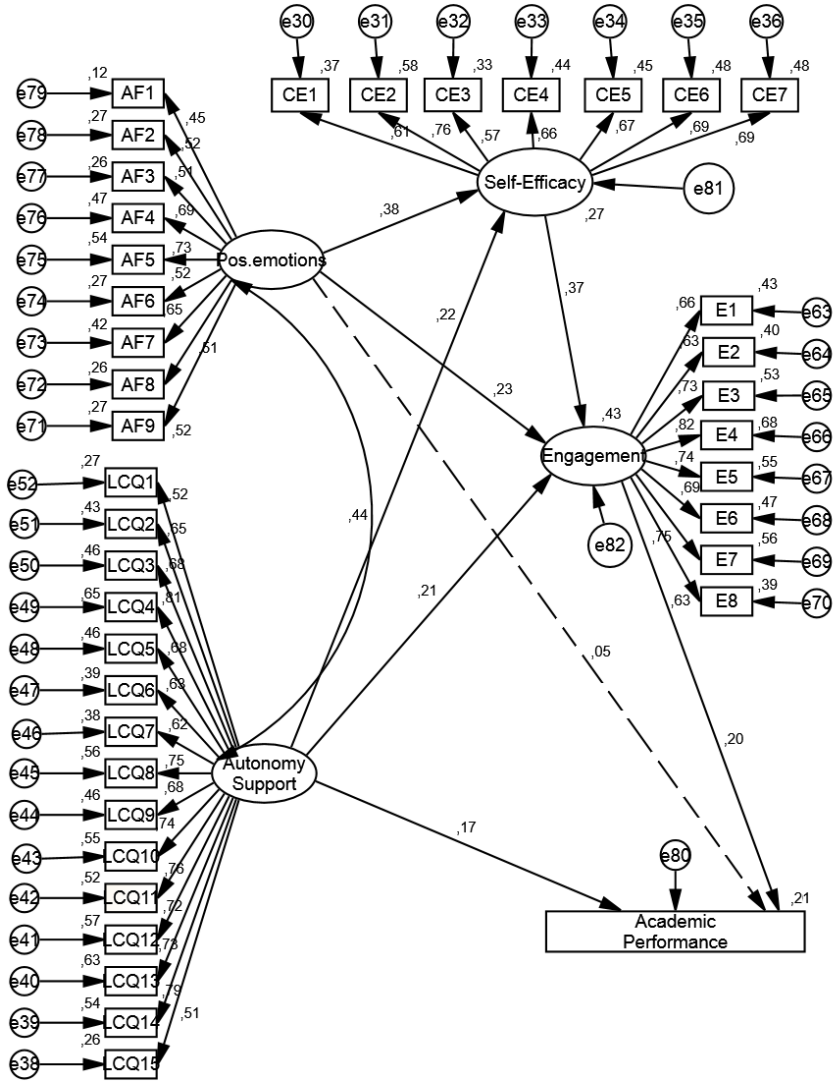

Figure 3. Second structural equation model with multiple mediation that takes self-efficacy ad predictor of academic engagement without direct effect on performance (Standardized parameters).

Discussion

Results show a significant moderate to high relation between all variables. The experienced positive emotions and the autonomy climate reveal close relations with self-efficacy and academic engagement. There are also observed relatively significant relations between self-perceived performance and academic engagement, self-efficacy and autonomy climate; and moderate relations with experienced positive emotions. The direct effect of both autonomy support and positive emotions on performance is significant, although in positive emotions this relation is weaker. When including the mediators, indirect relations are significant: support shows a partial indirect effect through the mediators, whereas, mediation is total for positive emotions and, thus, the predictive relation on performance is no longer significant.

Exactly as proposed in the first hypothesis, positive emotions and autonomy support show a significant direct effect on performance. This effect is stronger for autonomy support. Positive academic emotions allow students to enjoy the academic task they are executing and to have more perception of success. Therefore, previous

studies associated positive emotions, such as pride and hope, with more academic success (Pekrun et al., 2002; Pekrun & Perry, 2014).

Regarding the second hypothesis, it is observed that experienced academic emotions and teacher-provided autonomy support activate cognitive resources such as self-efficacy and academic engagement. Prior studies confirm the implication of teacher-provided autonomy support in students' motivation and interest in participating in academic tasks (Reeve, 2006; Sierens et al., 2009). Furthermore, it is suggested that when the acquisition of personal resources is facilitated by the environment, students feel more capable of performing the task and, therefore, acquire higher levels of self-efficacy (Sweetman & Luthans 2010).

Similar is the case of positive emotions, which, as posited by Fredrickson (1998, 2001), enhance the acquisition of more personal resources before the complex tasks present in teaching-learning processes (Pekrun & Perry, 2014). Activating positive emotions allows students to perceive a successful task execution, as opposed to negative emotions, which are related to more perceptions of failure (Schutz, 2014). For this reason, the model proves that positive emotions generate greater levels of self-efficacy and academic engagement.

It is necessary to point out that the first model propose that both self-efficacy and academic engagement play a mediator role at the same level. Nevertheless, the second model shows a better fit since it considers self-efficacy a predictor of academic engagement. This is supported by studies undertaken by Ouweenel, Le Blanc and Schaufeli (2011), which reveal that experiencing positive emotions predicts students' future personal resources, which, subsequently, predict academic engagement. Students that perceive themselves as self-efficient regarding their studies and that are hopeful and optimist show high levels of academic engagement. Furthermore, another study among secondary students reveal that self-efficacy is positively related to academic engagement (Caraway, Tucker, Reinke, & Hall, 2003).

The third hypothesis maintained that self-efficacy and academic engagement would predict performance. Results proved the existence of a predictive relation for academic engagement, which has been also confirmed by data found in other studies with similar results (Fredrickson, 2009; Schaufeli, Martínez, Marqués, Salanova, & Bakker, 2002). However, self-efficacy –contrary to the expected- does not show a significant relation nor it contributes to the explanation for performance. To that end, self-efficacy is considered a predictor of academic engagement, and academic engagement, in turn, a predictor of performance, but ruling out the direct relation between self-efficacy and engagement.

Other studies also exhibit results in which self-efficacy acts as predictor of academic engagement, which also corroborates the results of the second tested model (Bakker, Sanz, & Kuntze, 2015; Rodríguez-Sánchez, Salanova, Cifre, & Schaufeli, 2011). This result appears of special interest since self-efficacy would effectively imply that students feel more capable of executing an academic task, but –in fact- it is the engagement acquired which would explain an increase in performance. In other words, the results point out that there is high self-efficacy, but if not encompassed by commitment nor implication, it would not contribute to enhance performance.

Finally, and for further research, it is essential to balance women and man samples to the end of not only obtaining results that are more generalizable, but also being able to establish significant differences. Likewise, having into account that

academic performance has been assessed based on students' self-perception; it becomes necessary to gather actual performance through data provided by universities. Alternatively, it would be interesting to replicate the model using predictor variables that allow expanding knowledge of those emotional variables and its interaction with academic engagement. On the other hand, academic self-efficacy effectively predicts greater levels of academic engagement, despite the fact that it does not have a direct relation with performance. This may also be considered an interesting research line, because even though self-efficacy is probably related to more beliefs of success, success will not necessarily materialize as a real increase in performance without the existence of academic engagement.

Educational implications

Firstly, it must be stressed that the results allow recognizing that the type of relationship established between teachers and students in higher education remains fundamental. In addition, teachers should base this relationship on support and confidence, positively reinforcing students to allow them to feel capable of executing the tasks they face successfully. Experiencing positive emotions in the classroom apparently increase students trust in their capacities to achieve their objectives and enhances students' commitment to the task requested. Therefore, the role of teachers in delivering curriculum, reinforcement and activation of students' personal resources must not be overlooked.

These results should promote a different university teacher training, not only focused on a strong specialization in an academic and research area, but also in the mastering of effective teaching-learning strategies. As described in studies centered in academic emotions, students' cognitive resources are activated by interaction with emotional variables that predispose and yield thought and information processing tendencies. Thus, university teachers training should also include training in social and emotional skills that allow teachers to, in turn, activate their students' positive affective experiences.

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