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Self-Regulated Learning and Academic Performance – The Mediating Role of Students' Achievement Goals

Ramona PALOS[1], Silvia MAGUREAN[2], Merima Carmen PETROVICI[3]

Abstract

Previous research highlights that self-regulated learning makes a difference in students' achievement, and is helpful in improving their performance. The present study aimed to test a model which assumed that relationships between self-regulated learning and academic performance are mediated by the achievement goals that students endorse. 254 students enrolled in Psychology undergraduate courses were tested. The results showed that performance-approach goals were those which predicted grades and not mastery-approach goals. Moreover, performance-approach goals mediated the relationship between self-efficacy and academic performance. Also, two of the self-regulated learning components' (i.e., self-efficacy and self-regulation) predict academic performance directly, no matter what type of achievement goals students pursue. Knowing this, teachers can help students to learn better, to monitor their progress and to achieve their objectives.

Keywords: self-regulated learning, achievement goals, academic performance, motivation, social integration.

Introduction

Self-regulated learning is linked to the students' readiness for learning, to their engagement in academic tasks, and to the way they manage learning environment in order to achieve success (Singer & Bashir, 1999), being highly related to the quality of learning, students' outcomes and academic performance (Young, 2005). Academic performance can be influenced by multiple intellectual and

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non-intellectual variables (Richardson, Abraham & Bond, 2012; Veas, Castejón, Gilar & Miñano, 2015). Some of these variables, such as self-regulated learning strategies, motivational beliefs, and achievement goals, are considered more malleable and context-sensitive than others (Richardson *et al.*, 2012). However, evidence regarding the malleable and context-sensitive character of these variables is inconsistent. Vermetten, Lodewijks, and Vermunt (1999) indicated there is an individual consistency in the learning strategies that students use, something like a predisposition to learn in a consistent way. Rotgans and Schmidt (2009) showed that the motivational component of self-regulated learning (e.g., self-efficacy and task value beliefs) has a consistent variability between learning contexts. On the other hand, Credé and Phillips (2011) found that motivation and learning strategies are rather class-specific and, for the same individual, may vary across classes. Concerning the achievement goals, previous findings lead to the assumption they are more malleable and context-sensitive than motivational beliefs and self-regulated learning strategies. Thus, students can endorse specific goals depending on the classroom climate and environment (Hadwin, Winne, Stockley, Nesbit, & Woszczyna, 2001; İlker & Demirhan, 2012), the learning activities (Urdan & Giancarlo, 2001), or on the methods used by teachers in the assessment process (Howie & Bagnall, 2013).

The relationship between all these three variables (i.e., motivational beliefs, self-regulated learning strategies, and achievement goals) could be better understood through the cyclical self-regulated learning model (Zimmerman, 1998). Students identify the problem and the desired outcomes and then develop plans of action to obtain those outcomes. Assessing learning tasks, they also identify those cues which may give them information about how to deal with the tasks or how successful they will be in solving them (Hadwin *et al.*, 2001). Moreover, they analyze their beliefs about learning, their confidence and expectations to perform the task and to reach the goals they have set. All these variables (e.g., self-efficacy, intrinsic value) influence what students do or think themselves capable of doing (Zimmerman, 1998; Andrzejewski, Davis, Bruening & Poirier, 2016). Based on the assessment, they establish their goals. Depending on the goals they want to achieve (e.g., mastery or performance goals), they access different action scripts (e.g., focused on understanding, or on attaining good grades) and strategically adapt them to the learning situation. If the goals are concordant with their needs, values, and interests, they self-regulate their motivation and effort to achieve those goals (Boekaerts & Cascallar, 2006). The study context could also influence the tactics students applied, the resources they use and the goals they choose to pursue (Hadwin *et al.*, 2001).

Many studies have shown that achievement goals trigger some strategies learning and influence academic performance (Ranellucci, Hall & Goetz, 2015), but little empirical work has been conducted to see if motivational beliefs and self-regulatory learning strategies can lead to certain types of achievement goals and influence academic performance (Cerasoli & Ford, 2014). Therefore, the

present study aimed to fill this gap and to test a model which *assumed that the relationships between motivational beliefs and self-regulated learning strategies, as components of* self-regulated learning*, and academic performance is mediated by the achievement goals that students endorse*. The relations between all these variables were explored in a specific learning context (i.e., Psychology specialization).

Literature review

Self-regulated learning and academic performance

Self-regulated learning may be defined as an active process through which learners systematically use metacognitive, motivational and/or behavioral strategies (Zimmerman, 1990; Rotgans & Schmidt, 2009). Students who regulate their own learning "combine various self-regulation processes (e.g., goal setting, self-observation, self-evaluation) with task strategies (e.g., study, time-management, and organizational strategies) and self-motivational beliefs (e.g., self-efficacy, intrinsic interest)" (Cleary & Zimmerman, 2004: 538).

Although there are a lot of motivational and cognitive variables linked to academic performance, it is believed that self-regulated learning components are most directly involved in academic performance (Zimmerman, 1990). Previous research showed that self-regulation (e.g., metacognition, goal setting, planning, and effort management) is the best predictor of academic performance (Pintrich & De Groot, 1990). Richardson *et al.* (2012) meta-analysis revealed that students' grade point average (GPA) is predicted by a combination of motivation (i.e., academic self-efficacy, performance efficacy, grade goal) and self-regulatory capacity (i.e., effort regulation). Also, Credé and Phillips (2011) suggested that motivational variables are related to learning strategies, and some of these strategies are related to academic performance (Kubiatko, Hsieh, Ersozlu, & Usak, 2018). Komarraju and Nadler (2013) indicated the importance of self-efficacy in predicting higher grades as well, with it being the motivational variable that facilitates students' ability to regulate and sustain their effort and to achieve better performance. It seems that self-regulated learning makes a difference to students' achievement, and is helpful in improving their performance (Schunk, 2005), because it is considered an aptitude which can be developed (Smith, 2001; Andrzejewski *et al.*, 2016).

Students' achievement goals and academic performance

Achievement goals can be seen as "the cognitive representations of what individuals are trying to do or what they want to achieve" (Pintrich, Conley, & Kempler, 2003: 321). They are differentiated into mastery and performance goals, which can be further divided along two other dimensions: approach and

avoidance motivation (Elliot & McGregor, 2001). *Mastery approach-goals* focus on the development of competence or task mastery (Elliot, 1999; Senko, Hama & Belmonte, 2013). In the case of *mastery-avoidance goals*, the accent falls on avoiding misunderstanding or the failure to learn course material (Elliot & McGregor, 2001). *Performance-approach goals* are related to one's ability and sense of self-worth (Ames, 1992), and focus on the demonstration of competence relative to others (Elliot, 1999). *Performance avoidance-goals* focus on avoiding failure or performing poorly relative to others (Gaudreau, 2012).

The relationships between achievement goals and academic performance are also mixed and inconsistent (Huang, 2013). For instance, Sparfeldt *et al.* (2015) showed that the best predictors of academic performance are mastery-approach goals, followed by performance-approach goals and mastery-avoidance goals, while performance-avoidance goals do not have incremental value. On the contrary, Richardson *et al.* (2012) indicated that performance-avoidance goals have the strongest relationship with academic performance. Senko *et al.* (2013) suggested that in comparison to mastery orientation goals, performance-approach goals are more strongly related to the GPA. In the same line, there are also other studies which reported a higher effect of performance-approach goals on the final course grades (Wolters, 2004; Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Ranellucci, Hall, & Goetz, 2015). Payne, Youngcourt, and Beaubien (2007) found a small positive correlation between mastery goals and academic performance, and no relationship between performance-approach goals and academic performance. Finally, a not reliable difference between performance-approach goals and mastery-approach goals on students' final course grades, was identified by Yperen (2006). An interesting result was pointed out by Gaudreau (2012), who found that both mastery and performance-approach goals were positively associated with academic performance but the relationships are shaped by the reason for which the students pursue these kinds of goals (e.g., inherent pleasure, self-imposed pressure or an attempt to obtain rewards).

Self-regulated learning, achievement goals and academic performance

There is a large body of research emphasizing that achievement goals trigger certain self-regulated learning strategies and shape students' academic performance (Schunk, 2005; Payne *et al.*, 2007), but only a few identify a mediating role of achievement goals on the relation between self-regulated learning and academic performance. Students' achievement goals influence both motivational beliefs and self-regulated processes (Pintrich & De Groot, 1990; Schunk, 2005). Those who focus on acquiring knowledge or developing skills (i.e., pursue mastery-approach goals) use deeper cognitive processing and monitoring strategies and know how to manage their time and effort (Payne *et al.*, 2007). Mastery goals are positively related to task value, interest (Harackiewicz, Barron, Pintrich, Elliot, & Thrash,

2002), positive attributions and affect (Schunk, 2005), and students who pursue this kind of goals adjust their studying approach to meet the demands of the course, the teacher's style, and the type of test (Senko *et al.*, 2013). Students who strive to demonstrate their competence and to be better than others (i.e., pursue performance-approach goals) use surface but also deep learning strategies and have a vigilant approach to studying (e.g., seek and follow cues about how to succeed) (Senko *et al.*, 2013). The results regarding the avoidance-approach (i.e., performance or mastery) are not so conclusive, especially for mastery-avoidance goals. Some studies found no relationships between performance-avoidance goals and learning strategies (Payne *et al.*, 2007; Mouratidis, Vansteenkiste, Michou, & Lens, 2013), whereas others showed that self-regulation, cognitive strategy use, self-efficacy and intrinsic value decline in a performance-avoidance climate (İlker & Demirhan, 2012). Payne *et al.* (2007) also suggested that people who pursue mastery goals are more highly efficacious than those who pursue avoid-performance goals, and the level of test anxiety is lower for individuals who pursue mastery goals than for those who pursue performance-approach and avoidance goals. Although there are not many studies about mastery-avoidance goals, some of them revealed that having this kind of goal is a positive predictor of disorganized studies, a state of anxiety, worry, and emotionality (Elliot & McGregor, 2001).

Methods

Starting from the findings outlined above, the objective of the present study was to test a model which assumed that relationships between motivational beliefs and self-regulated learning strategies as components of self-regulated learning, and academic performance are mediated by the achievement goals that students endorse.

Participants and procedures

The research sample consisted of 254 students, 53 men (20.86%) and 201 women (79.13%). They were enrolled in the third year of Psychology undergraduate courses. The age of the participants ranged from 20 to 26 years (M=21.75, SD=1.16). Students volunteered to participate in the study, and there was no reward for their participation. The questionnaires were administered online at the beginning of the third year, and the students were assured regarding the confidentiality of their responses.

Measures

Academic performance was measured by the students' general performance from the second year of their studies. This was indicated by the average score of

final course grades, and it was obtained from the official university transcripts. In the Romanian educational system, grades range from 1 to 10; grades 5 (lowest) to 10 (highest) are all passing grades, whereas for grades under 5 the exams are considered failed. Because we were interested in assessing students' self-regulated ability based on already known academic performance, we opted for previous performance.

Students' *goal orientation* was evaluated through the Achievement Goal Questionnaire (AGQ – Elliot & McGregor, 2001). It is a 12-item measure that assesses learners' orientation according to a 2 X 2 model. The items and instructions were contextualized to be relevant to the Psychology specialization. For this reason, we actually assessed general achievement goals and not achievement goals for a specific school subject. There are four subscales for each type of achievement goal: performance-approach, performance-avoidance, mastery-approach, and mastery-avoidance. Students had to answer on a Likert scale scored from 1 (not at all true for me) to 7 (very true for me). The internal consistency for each scale ranged from $\alpha = .730$ to $\alpha = .913$.

Students' self-regulated learning was measured using the Motivated Strategies for Learning Questionnaire (MSLQ – Pintrich & De Groot, 1990), the most verified self-report instrument for assessing motivational and cognitive variables consistently linked to SRL (Roth, Ogrin & Schmitz, 2016). *Motivational beliefs* were assessed with three subscales that measure self-efficacy (9 items), the intrinsic value attached to that task (9 items) and test anxiety (4 items). *Self-regulated learning strategies* were assessed with two subscales that measure cognitive strategy use (e.g., rehearsal, elaboration; 13 items) and self-regulation (metacognitive strategies and effort management; 9 items). All items were scored on a 7-point Likert scale (1 – not at all true for me to 7 – very true for me). The internal consistency for each scale ranged from $\alpha = .756$ to $\alpha = .867$. The items and instructions were contextualized to be relevant to the Psychology specialization.

Data analysis

We used IBM SPSS AMOS 20 to analyze the data. To test de model fit, we considered the maximum-likelihood and the following report fit indices: Goodness-of-Fit (GIF), Adjusted Goodness-of-Fit (AGFI), Normed Fit Index (NFI), Comparative Fit Index (CFI). We decided against using RMSEA as a model fit indicator because it is not recommended for models with small df and small sample size since too often it falsely indicates poor fitting model (Kenny, Kaniskan, & McCoach, 2014). For GFI, AGFI, NFI, and CFI, values larger than .90 indicate acceptable model fit (Hooper, Coughlan, & Mullen, 2008).

Results

Descriptive analysis

Table 1 presents means, standard deviations, reliability (Cronbach' Alpha) and the zero-order correlations between all study variables. As can be seen from the table, self-regulated learning components have different association patterns with the achievement goals. Self-efficacy and intrinsic values (i.e., motivational beliefs) were positively associated with both performance-approach goals and mastery-approach goals, and self-efficacy was negatively related to mastery-avoidance goals. Cognitive strategies and self-regulation (i.e., self-regulated learning strategies) were positively associated with mastery-approach goals, while self-regulation was negatively related to performance-avoidance goals. Test anxiety was only related to avoidance goals, students with high levels of test anxiety had stronger performance and mastery-avoidance goals. Furthermore, we observed a positive correlation between mastery and performance-approach goals and academic performance, as well as the absence of any association between the avoidance goals and academic performance. Also, there were significant associations between self-efficacy, test anxiety and self-regulation, and academic performance.

Table 1. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10
1. AP	1									
2. PApG	.345**	(.94)								
3. PAvG	.026	.270**	(.80)							
4. MApG	.174**	.218**	.149*	(.92)						
5. MAvG	-.110	.120	.268**	.173**	(.71)					
6. SE	.385**	.336**	.000	.346**	-.133*	(.92)				
7. IV	.112	.147*	-.038	.471**	.045	.562**	(.78)			
8. TA	-.179**	.056	.171**	-.023	.522**	-.274**	-.108	(.77)		
9. CS	.080	.115	.114	.317**	.065	.250**	.398**	.110	(.79)	
10. SR	.194**	.023	-.146*	.176**	-.089	.179**	.157*	-.217**	-.411**	(.69)
Mean (SD)	1.51 (.50)	11.71 (5.45)	12.24 (5.10)	17.20 (3.23)	12.12 (4.55)	46.12 (8.01)	48.43 (6.91)	16.25 (5.29)	84.05 (17.13)	23.18 (10.96)

Note. N=254; AP=academic performance; PApG=performance approach goals; PAvG=performance avoidance goals; MApG=mastery approach goals; MAvG=mastery

avoidance goals; SE=self-efficacy; IV=intrinsic value; TA=test anxiety; CS=cognitive strategies; SR=self-regulation.

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). Internal consistency indices are presented in italics *on the diagonal*.

Model testing

The model we tested assumed that the relation between self-regulated learning components (e.g., motivational beliefs and self-regulated learning strategies) and academic achievement is mediated by achievement goals (e.g., mastery or performance goals), as shown in *Figure 1*. The relationships included in the model were based on the correlation matrix between the variables. Because avoidance goals were not associated with academic achievement, we included only approach goals in the mediation model. Fit indices presented in *Table 2* show the model has a good fit to the data. We additionally tested the mediation model including the avoidance goals as mediators along with the approach goals, and the results showed a poorer fit.
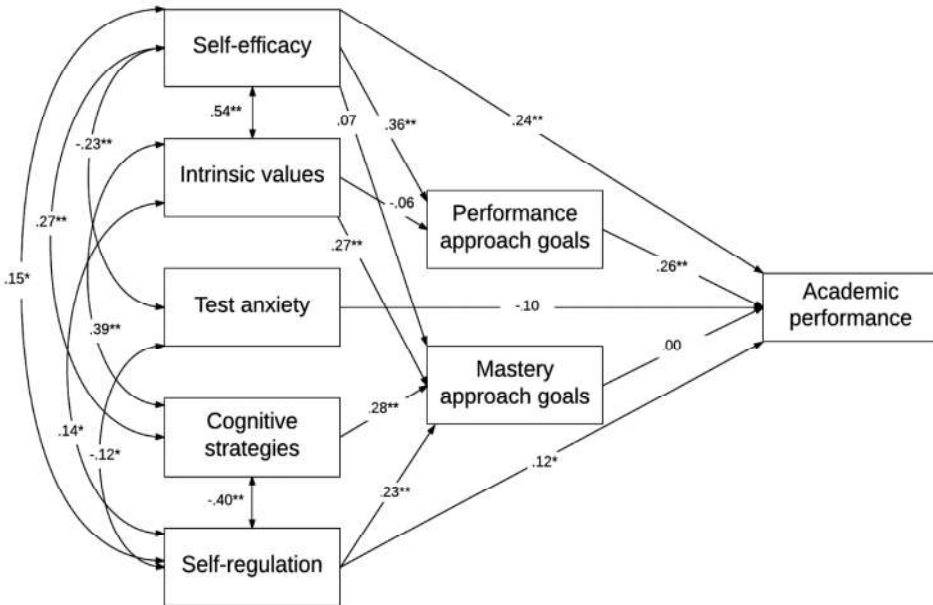
Note: Standardized estimates significant at: *p<.05; ** p<.01

Figure 1. The mediation model

Table 2. Model fit indices

χ^2	GFI	AGFI	NFI	CFI
$\chi^2(9)=32.18$, $p<.001$	.96	.87	.93	.94

Direct and indirect effects

Performance approach goals are seen to be significantly associated with academic performance, while mastery-approach goals diminish capability for predicting academic performance. Self-efficacy and self-regulation were significantly associated with academic achievement, while test anxiety diminished its predictive capability (p=.07).

Sobel tests were computed to analyze the mediating effects (Table 3). Performance approach goals significantly mediated the relationship between self-efficacy and academic performance. We did not observe any other significant effect of components of self-regulated learning on academic performance mediated by achievement goals.

Table 3. Standardized direct, indirect, and total effects for the hypothesized model

Predictor	Direct effects	Indirect effects	Total effects
Self-efficacy	.24	.09**	.33
Intrinsic value	.00	-.01	-.01
Test anxiety	-.10	.00	-.10
Cognitive strategies	.00	.00	.00
Self-regulation	.12	.00	.12
Performance approach goals	.26	-	.26
Mastery approach goals	.00	-	.00
Note: Sobel tests were computed for indirect effects; * for p<.05; ** for p<.01			

Discussion

The objective of the present study was to test a model that assumed that the relationships between motivational beliefs and self-regulated learning strategies as components of self-regulated learning, and academic performance are mediated by the achievement goals that students endorse.

Regarding the relationships between self-regulated learning components (i.e., motivational beliefs and self-regulated learning strategies), achievement goals and academic performance, most of our results are in line with other studies. For example, Pintrich *et al.* (2003) found positive correlations between four components of self-regulated learning (i.e., self-efficacy, the intrinsic value of the task, cognitive strategies use, self-regulation) and both mastery and performance-approach goals. Also, test anxiety, which can be considered as an indicator of a specific form of affect control (Richardson *et al.*, 2012), has positive relationships with both mastery and performance-avoidance goals. These findings are also congruent with other research (Payne *et al.*, 2007; Mouratidis *et al.*, 2013). Positive associations were found between self-efficacy, self-regulation and academic performance, whereas the correlation with test anxiety was negative. Performance and mastery-approach goals positively correlated with academic performance.

However, the most interesting results are those regarding the predictive capability of these variables. Thus, some of the variables which are related to academic performance lose their predictive capability when they are introduced into the comprehensive model. For instance, the intrinsic value attributed to the learning task (motivational beliefs component), the cognitive strategies that students used in the learning process and their metacognitive strategies and effort management (self-regulation component) predict mastery-approach goals. Although mastery-approach goals are associated with academic performance, when they are introduced into the model they do not predict academic performance anymore. Performance-approach goals are predicted only by self-efficacy (which is a motivational belief's component), and in turn, they predict academic performance. Contrary to some previous research on goal orientation (Sparfeldt *et al.*, 2015; Mouratidis *et al.*, 2013), our results indicated that performance-approach goals (not mastery-approach goals) predict academic performance. These findings are in line with Wolters' results (2004), but contradict those which emphasized that a small amount of variance in academic performance is explained by achievement goals alone (Huang, 2013), especially by the performance goals (Hulleman *et al.*, 2010).

One possible explanation for these results could be linked to the aim of our students. It is already known that achievement goals are shaped by the class' climate and environment (Hadwin *et al.*, 2001; İlker & Demirhan, 2012), or by the students' purposes (to pass the exam or to get good grades) (Gaudreau, 2012). Following the national ranking procedures, the Psychology program in our university was rated "A class" for excellence in education and research. The

number of students enrolled in Psychology studies has increased significantly, and the environment has become more and more competitive. If students want to get a scholarship and not to pay faculty fees, they have to achieve high performance (i.e., semester/annual weighted average). The system allows a reclassification after every semester's exams, and students can get this scholarship or can lose it, depending on their grades. This situation has created a competitive learning setting. In this case, they could pursue their teacher's "learning agenda", which makes them pay more attention to things that teachers value, to their hints or cues linked to assessment criteria, and studying diligently that material (Senko *et al.*, 2013). Also, it seems that performance-approach goals are linked to grades and to the preparing for the exams, while mastery-approach goals are linked to interest (Harackiewicz *et al.*, 2002), and increase of competence in special task or area (Wirthwein *et al.*, 2013).

Also, our analysis showed two other significant findings linked to self-efficacy and self-regulation. Firstly, the students' confidence that a task can be performed (i.e., self-efficacy – motivational beliefs component) predicted performance-approach goals, which mediated the relationship with academic performance. Secondly, self-efficacy predicted academic performance directly. These two results support previous studies (Harackiewicz *et al.*, 2002). Likewise, self-regulation, which comprises metacognitive strategies and effort management, predicted mastery-approach goals, but this kind of goal did not influence students' academic performance. Instead, self-regulation influenced academic performance directly. In fact, effort regulation is considered the strongest predictor of GPA, being responsible for persistence in case of difficult and challenging work (Harackiewicz *et al.*, 2002). Also, effort regulation is related to academic self-efficacy, which is another strong predictor of performance (Harackiewicz *et al.*, 2002). Concerning test anxiety, although it was negatively correlated to academic performance, its predictive capability in the tested model decreased.

To sum up, our results showed that two of the self-regulated learning components' (i.e., self-efficacy and self-regulation) predict academic performance directly, no matter what type of achievement goals students pursue. Moreover, according to our research, performance-approach goals were those which predicted grades and not mastery-approach goals. Also, performance-approach goals mediate the relationship between self-efficacy and academic performance. So, we cannot sustain that self-regulated learning components trigger certain achievement goals, although we have an exception, namely students' self-efficacy (e.g., a motivational belief variable) which predicted performance-approach goals endorsement and influenced academic performance.

Conclusion

It is already known that self-regulated learning is a desirable professional skill (Smith, 2001) which can make the difference to students in terms of academic performance (Schunk, 2005). The present study showed that performance-approach goals, students' self-efficacy and their ability to monitor and regulate the learning process predicted their academic performance. Regarding the type of achievement goals, at least one question becomes evident: if students are interested in getting good grades (i.e., pursue performance goals) to get a scholarship and avoid paying fees, is learning only worthwhile when good marks are received? These are short-term benefits (e.g., no fees), but what is going on in the long run? Maybe it would be more efficient to help students to set both performance and mastery goals. Besides, previous studies suggested those who set performance objectives, as opposed to mastery objectives, differ not in skills but in their emotional regulation and affect (Dweck & Leggett, 1988, as quoted in Sideridis & Stamovlasis, 2015). Helping students to set both performance and mastery goals would also require a shift in assessment methods, switching from summative assessment to formative assessment. Also, our findings pointed out two other components on which a teacher may work: self-efficacy and self-regulated learning strategies. Consequently, offering students support in their learning, monitoring progress and adjusting the support, setting up clear rules and expectations, can help them to feel competent (Mouratidis *et al.*, 2013), to learn better and to achieve their objectives.

This study has some strengths and limitations. A strong point of our research is that we assessed motivational beliefs, self-regulated learning strategies and achievement goals related to students' average performance across multiple classes (annual weighted average from the last year of study were used), and not those linked to a specific class. Credé and Phillips (2011) showed that motivational beliefs and learning strategies are more class-specific and may vary across classes for the same individual. Also, the latest studies showed that general goals are relevant for general academic outcomes, while specific achievement goals are more relevant for specific academic performance (Sparfeldt *et al.*, 2015). Therefore, assessing these variables over different classes, we tried to grasp a general tendency regarding them. A second strength is linked to the empirical support of the role of performance-approach goals on students' academic performance. An interesting issue will be to investigate if the achievement goals orientation remains stable over time or it depends on how the students' knowledge is assessed (Senko *et al.*, 2013). Previous findings indicated that students pay more attention to teachers' cues regarding final evaluation which leads them to approach learning in a strategic way (Hadwin *et al.*, 2001). Concerning the limits of the study, although the sample could be considered large enough, cautions for results' generalization should be taken. Firstly, they are based on questionnaires of the self-report type, which depends on the ability of respondents to be accurate in their introspection (Cools &

Van den Broeck, 2007). Secondly, our study was a cross-sectional one and did not allow us to investigate if or how these relations change over time. Moreover, some authors suggested that associations with GPA are overestimated by cross-sectional designs and prospective designs are more suitable for measuring predictors of academic performance (Richardson *et al.*, 2012). Thirdly, the relations were tested in a competitive learning environment, and we assumed this was an explanation of our results (e.g., the relationships between performance-approach goals and academic performance). Further research is needed to see if in a non-competitive environment the patterns of the relations remain stable. Despite these limitations, the results bring an added-value to both theory and practice.

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