

Running Head: OBSTACLES, FACILITATORS AND ACADEMIC PERFORMANCE

How Obstacles and Facilitators Predict Academic Performance:

The Mediating Role of Study Burnout and Engagement

Abstract

Most people would agree with the maxim that “success breeds success”. However, this is not the whole story. The current study investigates the additional impact of psychosocial factors (i.e., performance obstacles and facilitators) as well as psychological well-being (i.e., burnout and engagement) on success (i.e., academic performance). More specifically, our purpose is to show that, instead of directly affecting future performance, obstacles and facilitators exert an *indirect* effect via student well-being. The sample was composed of 527 university students who filled out a questionnaire, and whose previous and future academic performance (GPA) was taken from the university’s records. Structural equations modeling showed that the best predictor of future performance was the student’s previous performance. As expected, study engagement mediated the relationship between performance obstacles and facilitators on the one hand, and future performance on the other. Contrary to expectations, burnout did *not* predict future performance, although it was significantly associated with the presence of obstacles and the absence of facilitators. Our results illustrate that, although “success breeds success” (i.e., the best predictor of future performance is past performance) positive psychological states like study engagement are also important in explaining future performance, at least more than negative states like study burnout.

Key words: student well-being, burnout, engagement, obstacles, facilitators, performance

## How Obstacles and Facilitators Predict Academic Performance:

### The Mediating Role of Study burnout and Engagement

University and college experiences indeed result in distress for some students because they are involved in structured, coercive activities (e.g., attending classes and doing assignments) that are directed towards a specific goal (i.e., passing exams and acquiring a degree). This may take either the more general form of anxiety or depression (Abouserie, 1994; Chambel & Curren, 2005; Cotton, Dollard, & Jonge, 2002; Felsten & Wilcox, 1992), or the more specific form of study burnout (Balogun, Helemoe, Pellegrini, & Hoerberlein, 1995; Gold, Bachelor & Michael, 1989; Jemmott & Magliore, 1988; McCarthy, Pretty, & Catano, 1990; Powers & Gose, 1986; Schaufeli, Salanova, González-Romá & Bakker, 2002; Schaufeli & Salanova, 2007; Yang, 2004). Initially, the burnout concept was linked to human services such as healthcare, education, and social work where employees do “people” work of some kind (Maslach & Jackson, 1981). Later it was extended to include other occupational groups outside human services (Schaufeli, Leiter, Maslach & Jackson, 1996). For more than two decades however, burnout has also been observed among students (Gold & Michael, 1985; Meier & Schmeck, 1985; Nowack, Gibbons, & Hanson, 1985), and it manifests itself as feeling exhausted because of study demands, having a cynical and detached attitude towards one’s study and feeling incompetent as a student.

Although the results are not entirely conclusive, there is some evidence for a weak negative relationship between burnout and performance (Bhagat, Allie & Ford, 1995; Garman, Corrigan & Morris, 2002; Parker & Kulik, 1995; Sing, 2000; Wright & Cropanzano, 1998). More specifically, a recent meta-analysis of sixteen studies revealed that emotional exhaustion particularly relates negatively to work performance (Taris, 2006). In a similar vein, a negative relationship between burnout and academic achievement was found among students (McCarthy,

Pretty & Catano, 1990) Hence, it is plausible that burned-out students will perform poorly because they feel exhausted, used up, irritable, frustrated, detached, and cynical.

Evidently, students may also experience positive feelings and attitudes towards their studies; they may feel engaged and motivated because they are successful and have accomplished important goals. Engagement is a topic which has been investigated in the study context by taking its behavioral or psychological perspective into account (Horstmanshof & Zimitat, 2007). From the behavioural perspective, study engagement can be viewed as an outcome with a combination of intentions and successful academic and social integration within the study environment (Tinto, 1993). For example, McInnis (2001) saw engagement as a combination of intellectual application, diligence and participation in the learning community, which was underpinned by a sense of purpose. From a psychological level, engagement can be seen as a measure of student involvement with university studies. It represents ‘the amount of physical and psychological energy that the student devotes to the academic experience’ (Astin, 1984). In this research, we conceptualize study engagement as a persistent, positive affective-motivational state of fulfillment that includes three aspects: vigor, dedication, and absorption (Schaufeli et al., 2002; Schaufeli & Salanova, 2007; Salanova, Bresó & Schaufeli, 2005). Conceptually speaking, vigor and dedication relate negatively with the core burnout dimensions, exhaustion and cynicism, respectively. Whereas burned-out students lack energy and distance themselves by displaying a cynical attitude towards their studies, engaged students feel energetic and identify strongly with their studies as they are deeply involved in them.

In a seminal investigation of student-engaged academic behavior in secondary school classrooms, Frederick (1977) found that high-achieving students were academically engaged for 75% of the time, compared to 51% for low-achieving students. The longer students remain disengaged from tasks, the more likely their academic performances will suffer, resulting in

undesirable outcomes. So far, there is evidence for a positive relationship between engagement and performance at work (Demerouti & Bakker, 2008; Harter, Schmidt & Hayes, 2002; Schaufeli, Taris & Van Rhenen, 2008; Salanova, Agut & Peiró, 2005), as well as in study settings. For example, a positive relationship between engagement and performance was found in an experimental study with students performing a group task: the more engaged the student groups felt, the better they performed (Salanova, Llorens, Cifre, Martínez & Schaufeli, 2003). With Australian college students, Cotton, Dollard and de Jonge (2002) also found that satisfied students with low levels of anxiety and depression performed better, not only because they achieved better results, but also because they were more involved and engaged with the school and actively contributed to its effectiveness. In a similar vein, Chambel and Cural (2005) showed that levels of positive well-being (i.e. satisfaction) among Portuguese students had a direct positive impact on their performance.

This study extends the predictions of the Job Demands-Resources (JD-R) model (for further information about the model, see Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). This model assumes two processes in which burnout and engagement play a key role: (1) an effort-driven energetic process that starts with demands, leading to negative outcomes (e.g., poor performance) through burnout; (2) a motivational process that is driven by the availability of resources, leading to positive outcomes (e.g., high performance) through engagement. This mediating role of burnout and engagement between demands/resources and various negative/positive outcomes has been confirmed in various studies (Hakanen, Bakker, Schaufeli, 2006, Hakanen, Schaufeli, Ahola, in press; Llorens, Bakker, Schaufeli & Salanova, 2006; Korunka, Kubicek, Schaufeli & Hoonakker, in press).

In the present study we used performance obstacles and performance facilitators instead of demands and resources. Obstacles are defined as the characteristics of the situation that have the

capacity to impede job performance and restrict productivity (Brown & Mitchell, 1991, 1993; Carayon, Gurses, Schoofs Hundt, Ayoub & Alvarado, 2005; Peters & O'Connor, 1980). In other words, obstacles are tangible organizational characteristics that may potentially restrict performance. Following Carayon et al. (2005), we not only include performance *obstacles* that refer to *negative* factors that *hinder* performance, but also *positive* factors that *enhance* performance. These are called facilitators and are defined as those aspects of the situation that may promote performance or one's ability to optimally perform one's job (or study). So the current study includes negative (i.e., performance obstacles) and positive (i.e., performance facilitators) factors in a way that is analogous to the negative and positive factors that are included in job stress research (e.g., Karasek & Theorell, 1990; Siegrist, 1996; Schaufeli & Bakker, 2004). Obstacles and facilitators are similar to demands and resources, except that they are more specific and are, *by definition*, related to performance. While demands and resources may be used in different settings, obstacles and facilitators are specific for each situation, for example, "*The computer is down*", or "*Study information (easy access)*" (Brown & Mitchell, 1993; Carayon et al., 2005; Peters & O'Connor, 1980). We extended previous research by not only including situational (i.e., organizational and social) but also *personal* obstacles and facilitators referring to those individual or personal factors that may hinder or boost performance, respectively. Poor planning is an example of a personal obstacle, whereas personal facilitators are, for instance, flexibility and success expectations. We expect that both situational and personal obstacles and facilitators are related with student well-being and performance.

There is some evidence that organizational obstacles negatively affect psychological well-being, and that organizational facilitators play the opposite role; that is, they seem to improve psychological well-being (Brown & Mitchell, 1993; Schneider & Bowen, 1993). For example in a meta-analytic study about obstacles and outcomes (i.e., performance and affect-like satisfaction

and frustration), Villanova and Roman (2002) found that obstacles showed a weak negative relationship with performance and a fairly robust negative relationship with affect. However, in this study *no* indirect relationships between obstacles and performance via affect were investigated. In this study, we assume that instead of directly influencing performance, obstacles and facilitators have an *indirect* effect, namely through student well-being (i.e., burnout and engagement) (see Figure 1).

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Evidence for such an indirect effect is derived from the study of Cotton, Dollard and de Jonge (2002), who found that high study demands in combination with low control plus poor social support decreased student well-being, and subsequently resulted in poor academic performance. In addition, and in accordance with the authors' *happy-productive student hypothesis*, satisfaction mediated the impact of environmental factors on performance. Chambel and Curren (2005) showed that student's well-being also mediated the relationship between control and performance, but the mediating relationship was *not* found for unwell-being (i.e., anxiety and depression).

Based on our conceptual model (see Figure 1) we formulate the following four hypotheses:

H1: Previous performance predicts future performance ("Success breeds success").

H2: The better the previous performance, the fewer obstacles and the more facilitators perceived.

H3: Burnout mediates the relationship between obstacles/facilitators and future academic performance.

H4: Engagement mediates the relationship between obstacles/facilitators and future academic performance.

In addition, and in order to examine the full versus the partial mediation of obstacles/facilitators and of burnout/engagement, respectively, we will test an alternative model that includes direct paths from previous performance to burnout and engagement as well as direct paths from obstacles and facilitators to future performance.

## Method

### *Sample and Procedure*

A stratified sample of 867 students was drawn from around the 6,000 undergraduate students of a Spanish University based on the number of students of each of its three faculties. The final study sample was composed of 527 students; 67% were female and 33% were male. Participants originated from social and behavioral sciences (40%), chemistry and engineering (33%), and law (27%). All the study programs take four years to complete. As one-year follow-up GPA's were included, only the students from first (33.2%), second (42.9%) and third years (23.9%) participated in the research. The mean of age of the sample was 22 years and 6 months (SD = 2.6; ranging from 18 to 43 years). Questionnaires were distributed by psychology PhD students before a class started, and participation was voluntary. Originally, 863 students completed the questionnaire, but 236 students did not indicate their identification number so it was impossible to link their questionnaire data with their GPA as administered by the university. Therefore they were excluded from further analyses.

### *Measures*

In order to measure *performance obstacles and facilitators*, a self-constructed inventory was developed. Firstly we did a preliminary, independent, qualitative study in order to identify specific performance obstacles and facilitators for students. In this qualitative study, we used an



adaptation of the critical incident approach (Flanagan 1954). A brainstorming session was held with a group of forty university students in which the participants were asked to think about past situations when their academic performance was below par, and then to recall conditions and factors that were present at that time. Next, the participants answered similar questions about performance facilitators. By remembering these past situations where their academic performance was below par, the students had to recall the conditions or factors that helped them to either overcome obstacles or increase their performance. In the brainstorming session, the participants discussed the main obstacles and facilitators of their performance, first individually and then in small groups. Finally, a consensus was reached among all the members of the entire group. As a result of the critical incident group procedure, 35 obstacles and 31 facilitators remained. Subsequently, after the removal of redundant items, the researchers distinguished between organisational or academic, social or interpersonal, and personal obstacles and facilitators. They identified 24 obstacles (i.e., 15 organisational, 5 social and 4 personal obstacles) and 30 facilitators (i.e., 17 organisational, 7 social and 6 personal facilitators). Table 1 lists all the obstacles and facilitators.

Finally, an inventory was made of these two sets of obstacles and facilitators whereby a dichotomous scoring system was used: 0 (not present) to 1 (present). The sum of the number of obstacles and facilitators was used as a quantitative measure of the amount of academic obstacles and facilitators for all three categories (i.e., organisational, social and personal).

*Study burnout.* Exhaustion and cynicism was assessed with the MBI-SS (Student Survey) (Schaufeli, Salanova et al., 2002), whereby the third dimension of burnout, incompetence or lack of efficacy, was excluded because accumulating evidence suggests that this dimension plays a different role in the burnout process (Brenninkmeijer & Van Yperen, 2003; Bresó, Salanova & Schaufeli, 2007; Green, Walkey & Taylor, 1991; Lee & Ashforth, 1996; Shirom, 2005; Schaufeli

& Salanova, 2007). Hence, it was recently argued (Schaufeli & Taris, 2005) that exhaustion and cynicism constitute the core of burnout. The exhaustion (EX) scale includes 6 items (e.g., *“I feel emotionally drained by my studies”*) and the cynicism (CY) scale includes 4 items (e.g., *“I doubt the significance of my studies”*). All the items were scored on a 7-point frequency rating scale ranging from 0 (“never”) to 6 (“always”). The internal consistencies (Cronbach’s  $\alpha$ ) for EX and CY were .74 and .77, respectively.

*Study engagement* (i.e., vigor and dedication) was assessed with the UWES-SS (Student Survey) (Schaufeli, Salanova et al., 2002), whereby the third dimension of engagement, absorption, was excluded because evidence suggests that this dimension plays a different role in the engagement construct (Mauno, Kinnunen and Ruokolainen, 2007; Salanova et al., 2003). Hence, it was recently argued (Schaufeli & Salanova 2007) that vigor and dedication constitute the core of burnout. The vigor (VI) scale includes 6 items (e.g., *“When I’m doing my work as a student, I feel bursting with energy”*) and the dedication (DE) scale includes 5 items (e.g., *“I am enthusiastic about my studies”*). The UWES-SS items score similarly to those of the burnout inventory. The internal consistencies (Cronbach’s  $\alpha$ ) for VI and DE were .75 and .84, respectively. In order to avoid answering bias, the burnout and engagement items were merged randomly.

*Academic performance* was measured by the students’ GPA of the previous semester (i.e., previous performance) and of the following semester (i.e., future performance). GPA was taken from the university records. In the Spanish grading system, GPA ranges from 5 (low) to 10 (high). Students’ GPA was linked to their questionnaire data by using their student registration number.

*Data Analyses*

A preliminary Confirmative Factor Analysis (CFA) of two latent factors was performed, i.e., performance obstacles and facilitators, with three indicators each, i.e., organisational, social and personal obstacles and facilitators. In addition, structural equation modeling (SEM) methods, as implemented by AMOS (Arbuckle, 1997), were used to test the research model (see Figure 1) and also in alternative mediation model with additional direct paths from previous performance to burnout and engagement, and from obstacles and facilitators to future performance. Maximum likelihood estimation methods were used and the input for each analysis was the covariance matrix of the items. The goodness-of-fit of the models was evaluated using absolute and relative indices. The *absolute* goodness-of-fit indices calculated were: (1) the  $\chi^2$  goodness-of-fit statistic; (2) the Root Mean Square Error of Approximation (RMSEA); (3) the Goodness-of-fit Index (GFI); and (4) the Adjusted Goodness-of-fit Index. (Jöreskog & Sörbom, 1986). Since the  $\chi^2$ -test is sensitive to sample size, the computation of relative goodness-of-fit indices is strongly recommended (Bentler, 1990). The following *relative* goodness-of-fit indices were computed: (1) Normed Fit Index (NFI); (2) Non-Normed Fit Index (NNFI) – also called the Tucker Lewis Index (TLI); and (3) Comparative Fit Index (CFI). (Marsh, Balla & Hau, 1996). Since the distribution of the GFI and the AGFI is unknown, no statistical test or critical value is available (Jöreskog & Sörbom, 1986). For RMSEA, and as a rule of thumb, values smaller than .08 are considered to indicate an acceptable model fit (Cudeck & Browne, 1993), whereas f values greater than .90 or all three relative fit indices are considered to indicate a good fit (Hoyle, 1995). Finally, we computed the Akaike Information Criterion (AIC; Akaike, 1987) to compare competing models because it is particularly well suited for comparing the adequacy of the non-nested models that are fitted to the same correlation matrix. The lower the AIC index, the better the fit.

## Results

### *Descriptive analyses*

Table 1 displays a list of performance obstacles and facilitators as a result of the qualitative data analyses done. As Table 1 shows, the main obstacles are organisational in nature, such as “*Agglomeration and insufficient reprography service*”, “*Overload: too many tasks to do well*“, and personal “*Anticipatory anxiety for the exams*”. The main facilitators are also organisational in nature, such as “*Library opened with photocopy machine at night during the exam periods*”, “*Photocopying service*”, but social facilitators were also mentioned, such as “*Tolerance and group cohesion among colleagues*” and “*Social support from family and friends*”.

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Table 2 displays the means, standard deviations, intercorrelations, and internal consistencies (Cronbach’s  $\alpha$ ) of the study variables. As seen from Table 2, all the values of  $\alpha$  meet the criterion of .70 (Nunnaly & Bernstein, 1994). Except for personal obstacles and personal facilitators, all other obstacles and facilitators are *positively* related, meaning that the more obstacles students perceive the more facilitators they identify.

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### *Preliminary Confirmatory Factor Analysis*

We tested two competitive models to discover whether performance obstacles and facilitators constitute one common latent factor or two correlated latent factors (i.e., performance

obstacles and performance facilitators). The one-factor model did not fit the data well ( $\chi^2_{(9)} = 60.809$ ;  $p < .00$ ; GFI=.96; AGFI=.90; RMSEA=.11; NFI=.82; CFI= .87; AIC= 84.80). In contrast, the two-factor model fitted the data very well ( $\chi^2_{(8)} = 14.159$ ;  $p < .08$ ; GFI=.99; AGFI=.97; RMSEA=.03; NFI=.97; CFI= .98; AIC= 40.159). This model postulates two underlying positively correlated constructs: performance obstacles and facilitators with three indicators each: organisational, social and personal obstacles on the one hand, and organisational, social and personal facilitators on the other hand. This model confirms the qualitative results of the three categories of obstacles and facilitators.

### *Model Testing*

First of all, the fit of the research model, as depicted in Figure 1, was tested to the data. The research model fits the data well as all the fit indices meet their respective criteria (see Table 3), and all the path coefficients are significant, except the paths from previous performance to performance obstacles ( $\beta = -.02$ , n.s.) and from burnout to future performance ( $\beta = .05$ , n.s.) (see Figure 2). These results confirmed Hypothesis 1, that is, success leads to success: previous performance positively predicted future performance ( $\beta = .72$ ,  $p < .001$ ). Hypothesis 2 was confirmed for facilitators but not for obstacles: the better the previous performance, the more facilitators were perceived, but the fewer obstacles were *not* perceived. Regarding Hypotheses 3 and 4, the results were as expected, that is, engagement mediates the relationship between obstacles and facilitators on the one hand and future performance on the other hand, whereas, unexpectedly, burnout does not. Hence, Hypothesis 4 was confirmed in relation to the mediating role of engagement, while Hypothesis 3 was not confirmed in relation to the mediating role of burnout (i.e., the more obstacles perceived the more burnout, but burnout, in turn, does not predict future academic performance).

In order to test whether the impact of obstacles and facilitators on future performance is fully or partially mediated by student's well-being, an alternative model was subsequently fitted to the data. As seen from Table 3, this alternative model also fits the data well, although its fit did not improve when we compared it to the original model ( $\Delta \chi^2_{(4)} = 4.25$ , n.s.). In the alternative model however, the direct paths from past performance to burnout ( $\beta = -.02$ , n.s.), from past performance to engagement ( $\beta = .06$ , n.s.), from obstacles to future performance ( $\beta = .11$ , n.s.) and from facilitators to future performance ( $\beta = -.06$ , n.s.) were all non significant. Moreover the AIC of the research model was lower than that of the alternative model. Collectively, this means that the impact of obstacles and facilitators on future performance is fully mediated by student's well-being, and especially by engagement.

Finally, Sobel tests were calculated to assess whether or not a mediator variable significantly carries the influence of an independent variable to a dependent variable; i.e., whether the indirect effect of the independent variable on the dependent variable through the mediator variable is significant. The results show that the indirect effect of obstacles on future performance through engagement comes close to significant ( $t=1.87$ ,  $p=0.06$ ), whereas the indirect effects of facilitators on future performance through engagement and of past performance to engagement through facilitators are significant ( $t= 1.99$ ,  $p=0.04$  and  $t=2.08$ ,  $p=0.03$ , respectively).

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Figure 2 displays the standardized path coefficients of the research model, which account for 56% of the variance of student's future academic performance. Figure 2 shows what was

expected, that is, the paths from obstacles to engagement and from facilitators to burnout are both negative, meaning that the more obstacles students perceive, the less engaged they are, and the more facilitators they experience, the less burned-out they feel. Obstacles and facilitators are positively correlated (see Table 1), whereas burnout and engagement are negatively related.

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### Discussion

This study investigated the mediating role played by student well-being (i.e., burnout and engagement) in the relationship between perceived performance obstacles and facilitators, and future academic performance. Engagement, and not burnout, was found to fully mediate the impact of performance obstacles and facilitators on future academic performance: that is, facilitators are positively associated and obstacles are negatively associated with engagement, circumstances which, in turn, positively affect future academic performance. In addition to the indirect effects of obstacles and facilitators through student well-being (i.e., engagement), future academic performance was strongly predicted by past performance. It is not surprising that success breeds success, but our study underscores the additional importance of obstacles, facilitators and student's well-being in predicting future academic success..

As expected, obstacles were positively associated and facilitators were negatively associated with burnout, but *no* significant effect of burnout on future academic performance was observed. The latter agrees with past research, which either failed to find a link between burnout and performance or found a very weak relationship, particularly when performance was measured by using objective indicators (Demerouti & Bakker, 2008; Taris, 2006). In short, those students who perceive many facilitators and few obstacles in their environment feel engaged, which may

boost their future academic performance. However, those students who perceive many obstacles and few facilitators feel burned-out, but that does not seem to affect their future academic performance.

In addition, a positive association was found between obstacles and facilitators. At first glance this might seem rather puzzling because one would expect that obstacles and facilitators to be negatively related given the fact that facilitators mitigate problems caused by obstacles that interfere with performance (Tesluk & Mathieu, 1999). However, it can be speculated that those students who perceive many obstacles look actively for facilitators as a way of coping by way of compensation (Eriksen, Olff & Ursin, 2000). Interestingly, not all the performance obstacles and facilitators seem to work similarly. For example, personal obstacles and facilitators are not positively correlated, but organisational and social obstacles and facilitators are. This finding strengthens a speculative explanation that it is easier, by way of coping, to identify performance facilitators in the social and organisational environment than in one's own person.

### *Theoretical Implications*

Our results agree with recent research on how positive personal and environmental factors increase engagement which, in turn, increase specific positive behaviors, such as performance (Salanova, Agut & Peiró, 2005) or organisational commitment (Schaufeli & Bakker, 2004). Moreover, the finding that the students' perception of obstacles and facilitators affects their academic performance via increasing levels of study engagement one semester later agrees, in part, with the JD-R model (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Specifically, the assumption of the JD-R model that engagement mediates the relationship between job demands and performance (motivational process) was confirmed in this study, whereas the mediating role of burnout in the relationship between job demands and performance was not confirmed. Moreover, exhaustion, but not cynicism, is negatively and significantly related with



performance (see Table 2). Our model extends previous research in which the relationships between job demands and engagement were contradictory (Llorens, Bakker, Salanova & Schaufeli, 2006; Schaufeli & Bakker, 2004). Nevertheless, job resources have a particular impact on engagement when demands are high (see Bakker, Hakanen, Demerouti & Xanthopoulou, 2007). In our study, we observed that the more obstacles perceived, the less engaged the students feel. So perhaps including obstacles in future studies with the JD-R model instead of demands would result in a less ambiguous negative relationship with engagement.

On a more general level, our results agree with Hackman and Oldham's (1980) Job Characteristics Theory (JCT), which assumes that the so-called critical psychological states (i.e., meaningfulness, responsibility and knowledge of the results) mediate between job characteristics (i.e., organisational facilitators or resources such as variety, task identity, task significance, autonomy and feedback) and outcomes (e.g., job performance). In our study, engagement, but not burnout, seems to play an analogous role in a critical psychological state. However, our findings expand the JCT because, according to this theory, critical psychological states are primarily cognitive in nature, whereas our engagement construct primarily reflects a motivational state. Hence, it appears that obstacles and facilitators affect students' motivation which, in turn, induces good performance.

The fact that a positive state, such as engagement, increases performance in students also agrees with the so-called "*Broaden-and-Build*" theory of positive emotions (Fredrickson, 2001). This theory posits that the experience of positive emotions broadens thought-action repertoires and builds enduring personal resources. Although Fredrickson's theory is about emotions, such as joy, interest and contentment, it can be speculated that study engagement, which includes enthusiasm, pride, inspiration and challenge, might have a similar effect on broadening habitual

modes of thinking and acting, and thus increases the likelihood of displaying better future performance.

### *Practical Implications*

Our findings showed that engagement is directly related to performance, which offers the possibility to enhance engagement, and boost performance, through increasing facilitators or decreasing obstacles. However it is important to note that most of the variance of future performance was accounted for by previous performance, which confirms the layman's belief that success breeds success. Nevertheless, past performance is also likely to be influenced by obstacles and facilitators via engagement. Hence, performance may not only be promoted by increasing facilitators and decreasing obstacles, but also by enhancing engagement directly. In Spanish and Belgian students, Salanova, Bresó and Schaufeli (2005) showed that engagement may be increased by enhancing student's efficacy beliefs. In their study, a gain spiral was observed in which past academic success reinforced efficacy beliefs and engagement, resulting in more positive future efficacy beliefs. In this way, efficacy beliefs may boost students' engagement levels and, eventually, their performance.

Although no effect was observed of burnout on future performance in this study, relationships with obstacles and facilitators apparently exist in the sense that the presence of more obstacles and of less facilitators is associated with study burnout, which may decrease by removing obstacles and augmenting facilitators. By doing so, burnout is not only expected to decrease (which is a valuable outcome for students in itself), but performance may also increase indirectly via student engagement.

### *Limitations and future research*

Our results may be partly influenced by common method variance because self-report questionnaires were used to measure the obstacles, facilitators, burnout and engagement.

However, we used an objective measure of academic performance, GPA, so that the common method variance problem is less serious for this focal outcome variable. Furthermore, an independent qualitative study was used as the basis to make the list of obstacles and facilitators, and this may have also lowered the method variance.

Although our study was of a prospective design, in which future academic performance was predicted not only from the current perceptions of academic obstacles and facilitators and student well-being (i.e., burnout and engagement), but also from previous objective performance, a future longitudinal research could investigate the dynamic reciprocal nature of all the study variables. For instance, academic performance may also lower the perception of obstacles or increase facilitators in the sense of accumulating resources over time, as described by the Conservation Of Resources Theory (the COR Theory by Hobfoll & Shirom, 2001).

#### *Final Note*

Despite the limitations, on the one hand, the results of our study make a strong case for the existence of a motivational process that links positive perceptions of personal and environmental factors (facilitators) via engagement to future performance, as objectively assessed by students' GPA. On the other hand, a health impairment process also seems to exist, that is, the presence of obstacles and the absence of facilitators are associated with study burnout. However, this process is not involved in predicting performance, thus illustrating the independence of both processes.

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Table 1

*Frequency, percentage (%) and category (i.e., organisational, social or personal) of performance obstacles and facilitators in the study (n=527)*

Order	Obstacles	Frequency	%	Category
1	Agglomeration and insufficient photocopying service	380	72	ORGANIS.
2	Overload (e.g., Too many tasks to do everything well)	277	52.6	ORGANIS.
3	Anticipatory anxiety for the exams	263	50	PERSONAL
4	Mismatch between time - number of credits for courses (e.g., too many credits per semester)	241	45.7	ORGANIS.
5	Agglomeration and insufficient food	238	45.2	ORGANIS.
6	Inadequate temperature in common spaces	235	44.6	ORGANIS.
7	Problems with schedules (e.g., overlaps class.)	231	43.8	ORGANIS.
8	Inappropriate transport to the University	223	42	ORGANIS.
9	Personal lack of planning and organization time	218	41.4	PERSONAL
10	Non ergonomic desks and blackboards.	174	33	ORGANIS.
11	Inadequate preparation for career opportunities	140	26.6	ORGANIS.
12	Library with few books	126	24	ORGANIS.
13	Insufficient or inappropriate spaces	124	23.5	ORGANIS.
14	Lack of personal training and background needed for studying	119	22.6	PERSONAL
15	Lack of information about what tasks I have to do, meeting deadlines, etc.	106	20.8	ORGANIS.
16	Lack of financial resources	96	18.2	PERSONAL
17	Performing tasks that require too much concentration, attention and memory	87	16.5	ORGANIS.
18	Limited information and insufficient student assistance service	78	14.8	ORGANIS.
19	Teachers are late for teaching and/or tutoring	66	12.5	SOCIAL
20	Teachers are absent for teaching and/or tutoring	64	12	SOCIAL
21	Dealing with difficult issues with classmates, teachers .. (e.g., exam review, teamwork)	57	10.8	SOCIAL
22	Performing routine and repetitive tasks	37	7	ORGANIS.
23	Excessive competitiveness among peers	36	6.8	SOCIAL
24	Too many teachers per course	26	5	SOCIAL

## Obstacles, Facilitators, and Academic Performance 30

Order	Facilitators	Frequency	%	Category
1	Library opened with a photocoppy machine at nights during the exam period	264	50.1	ORGANIS.
2	Photocopying service (e.g., access for notes and other materials)	235	45	ORGANIS.
3	Tolerance and group cohesion among colleagues	224	42.5	SOCIAL
4	Social support from family and friends	216	41	SOCIAL
5	Access to students' grants	169	32.1	ORGANIS.
6	Tutoring time available	158	30	SOCIAL
7	Living in the city where I am studying	152	28.8	PERSONAL
8	Access to computer labs (e.g., Internet, e-mail).	149	28.3	ORGANIS.
9	Information about the study program prior to enrollment	142	26.9	ORGANIS.
10	Information Services for students	138	26	ORGANIS.
11	Personality characteristics (e.g., responsibility, optimism, extraversion, mental flexibility)	138	26.2	PERSONAL
12	Good social relationships with teachers	135	25.6	SOCIAL
13	Sunny and properly lighted and ventilated classrooms	130	24.7	ORGANIS.
14	Practical with few students	123	23.3	ORGANIS.
15	Personal positive expectations in labor market	122	23.1	PERSONAL
16	Personal expectations for success in studies	112	21.3	PERSONAL
17	Transport to/from the university (e.g., frequent buses)	103	19.5	ORGANIS.
18	Having economic resources (e.g., money, computer, car).	103	19.5	PERSONAL
19	Timetable flexibility for doing practical classes	99	18.8	ORGANIS.
20	Feedback from teachers or colleagues	91	17	SOCIAL
21	Existence of the figure of student delegate	88	16.7	SOCIAL
22	Having autonomy to determine what tasks I will perform everyday	77	14.6	ORGANIS.
23	Previous knowledge, skills and training before enrollment	69	13.1	PERSONAL
24	Granted cultural activities (e.g., theatre, sports).	67	12.7	ORGANIS.
25	Good relationships with staff and services employees	54	10	SOCIAL
26	Administrative services being located in the same building	53	10	ORGANIS.
27	Access to student language learning service	45	8.5	ORGANIS.
28	Getting immediate feedback from the task about my performance	27	5.1	ORGANIS.
29	Access to University-Enterprise Foundation service	25	4.7	ORGANIS.
30	Student association	22	4	ORGANIS.



Table 3

*The fit of the hypothesized research model (M1) and the alternative model (M2) (n=527)*

	$\chi^2$	df	p	GFI	AGFI	RMSEA	NFI	IFI	CFI	AIC	$\Delta \chi^2$	df
Research model	115.470	46	.00	.96	.94	.05	.93	.93	.95	179.47		
Altern. model	111.215	42	.00	.96	.93	.06	.93	.92	.95	183.21	M1-M2= 4.25ns	4

*Note.*  $\chi^2$  = Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; NFI= Normed Fit Index; IFI = Incremental Fit Index and CFI=Comparative Fit Index. AIC= Akaike Information Criterion;  $\Delta \chi^2$ = Delta Chi-square; M1 = research model. M2= alternative model; ns= non-significant differences.



Figure Caption:

Figure 1: The hypothesized model

Figure 2: M1: The final model (standardized path coefficients)

Note: ns = non-significant; \*  $p < .05$ ; \*\*\*  $p < .001$



