

# Learning-related motives and the perception of the motivational quality of the learning environment:

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How can university students' motivation to learn be enhanced? To achieve this, first we should know: What motivational value do students attribute to each particular component of learning environments? To which degree is this value mediated by students' motivational orientations? To respond to these questions, 1,166 university students were administered two questionnaires, one for assessing their motivational orientations and the other, their perceptions of the characteristics of their learning environment. Descriptive and multiple-regression analyses were performed to respond to the questions. Results support predictions concerning both questions, suggesting that motivation modulates the motivational effect of learning environments.

*Motivaciones relacionadas con el aprendizaje y percepción del valor motivador del entorno instruccional.* ¿Cómo puede mejorarse la motivación de los universitarios por aprender? Para conseguir este objetivo es necesario conocer: ¿Qué valor motivacional atribuyen a los distintos componentes del entorno de aprendizaje? ¿En qué medida este valor está mediatizado por sus características motivacionales? Para responder a estas dos preguntas, 1.166 universitarios respondieron un cuestionario para evaluar sus características motivacionales y otro para evaluar su percepción del valor motivacional de las características del entorno instruccional, y se realizaron análisis descriptivos y de regresión. Los resultados apoyan las predicciones realizadas, sugiriendo que la motivación modula el efecto motivacional del entorno de aprendizaje.

How university students' motivation to learn can best be enhanced? This is a question of growing interest among educators and researchers. Different authors have proposed instructional models aimed at creating highly motivating learning environments (Alonso-Tapia & López, 1999; Ames, 1992; Assor, Kaplan, & Roth, 2002). However, empirical evidence about the effectiveness of educational interventions based on these models at university level does not answer all questions about the scope and reasons for such effectiveness. What motivational value do students attach to different teaching activities? In what way do individual differences in goal orientations —or in the specific motives or needs underlying such orientations— modulate the degree of motivation enhancement achieved by instruction designed according to such models? Answering these questions is important if we are to be able to improve the motivational efficiency of learning environments and to adjust them to different kinds of student, as it is not the learning situation itself that is crucial, but its meaning for the student. To answer the questions just posed it is necessary, first, to define teaching patterns aimed at enhancing learning motivation; second, to decide what motivational characteristics could modulate the motivational effect of teaching patterns; and,

third, to study interactions between students' motives and learning environments.

## Learning environment

In relation to *learning environment*, research on teaching patterns affecting student motivation has underlined the importance of following several principles in order to motivate students to strive for understanding and meaningful learning, and not only for passing examinations. The three most important principles —though not the only ones (Ames, 1992)— are a) Professors should make their students feel that they act with autonomy, looking for their own goals (Deci & Ryan, 1985); b) professors should propose objectives and tasks that imply a reasonable degree of challenge and whose achievement has personal significance for the students (Assor & Kaplan, 2001), and c) professors should make sure that their students achieve a reasonable experience of progress in order to avoid a decrease in their expectancies of success (Eccles & Wigfield, 2002).

The general principles just mentioned point to more concrete teaching strategies that can be organized around different points along the learning sequence, as several authors have suggested, though their evidence come most of the times from non-university students (Ames, 1992). Some of these strategies are briefly described next.

- 1) *At the beginning of learning activities, when professors need to activate the learning intention.* At this point it seems

important to arouse curiosity, to show task relevance in relation to students' interests, values and objectives and to design learning tasks with a reasonable degree of challenge (Hidi & Renninger, 2006). Strategies such as the presentation of new or surprising information and the setting of problems and questions are useful for the first purpose, whereas the use of authentic tasks showing the usefulness of knowing what the student are to learn or the explicit indication of task functionality can be useful for the second purpose (Alonso-Tapia, 2002).

- 2) *During the development of learning activities, when professors need to keep students' attention focused on the learning process rather than on outcomes.* Depending on the academic subject to teach, professors explain concepts, principles, theories, procedures and strategies; design activities and projects that students have to carry out in classrooms, laboratories, etc., working alone or in group; induce —or force— students in lesser or greater degree to publicly participate in classroom discussions and activities; and give different amount and type of feedback and help. Professors act in different ways when carrying out these activities but, in accordance to the motivational principles above mentioned, the literature revised suggests the convenience of adopting the teaching patterns described next.

In the first place, when *introducing subjects or activities*, professors' messages and instructions should focus students' attention on learning processes and intrinsic goals instead of focusing on outcomes, social comparison and assessment. Professors should also help students to visualize and develop a precise planning and timing of activities to be carried out. This help can prevent students to become lost while trying to follow an explanation or to develop a project, and helps them to self-regulate their work. (Alonso-Tapia & Pardo, 2006).

In the second place, when *giving information and explanations*, professors should make sure that students' experience understanding (Assor & Kaplan, 2001). This can be achieved:

- If professors make use of hierarchical and coherent discourse, properties that are not warranted *a priori* by its formal characteristics. It is necessary to build a bridge between «the given» —what the student already knows— and «the new» —the ideas that the professor is trying to convey and explain—. This objective is better achieved if professors induce the students to participate, thus showing whether they understand or need clarification.
- If professors make use of illustrations and examples that help to build more concrete mental representations of abstract ideas (Alonso-Tapia & Pardo, 2006).

In the third place, when professors *interact* with their students, research on autonomy-supportive teaching behaviors reviewed by Assor & Kaplan (2001) has shown that it is beneficial for students' motivation to allow students to intervene spontaneously, to listen to them attentively and to request more explanation of their answers, to reinforce these answers «echoing» them and nodding while student is speaking, to highlight the positive elements of responses

even if they are incomplete, to praise «quality» of outcomes, to ask for reasons behind incorrect answers, to devote time to any student who asks for help and to avoid comparison between students.

Finally, when professors have to propose learning activities in which their students should involve independently, motivation can be favored —once curiosity have been activated and relevance had been shown— if professors a) suggest the establishment of personal goals; b) gave opportunity for options; c) teach their students to ask themselves «How can I do it?» and to look for the necessary means and strategies; d) suggest to their students to divide tasks into small steps; e) underscore the importance of asking for help; f) give careful feedback and help as often as needed; and f) highlight progress and students' active role in it (Black & William, 1998)

- 3) *At the points —during or at the end of learning activities— at which assessment takes place.*

Research on assessment implications for motivation and learning have underlined that assessment process can positively influence motivation to learn and conceptual understanding depending on certain conditions (Birebaum et al., 2006): a) If they provide information that may help students to overcome their difficulties and to self-regulate their understanding and learning processes (Black & William, 1998); b) if tasks demanding the *application and use* of knowledge for solving problems implying some degree of novelty (*analogous* and *transfer tasks*) are used (Schnotz & Preu, 1997), especially if professors make explicit for what goals understanding of a particular content is relevant, if tasks are designed to allow professors to identify specific factors in students that hinder conceptual change and procedural learning, and if professors give specific help based on assessment, whether this takes place before, during or after instruction; c) if professors avoid messages and classroom practices stressing the relevance of assessment for goals extrinsic to understanding and give messages that focus student's attention on progress as an intrinsic goal (Ames, 1992).

Other teaching patterns, strategies and environmental variables can affect motivation in academic contexts (Meece, Anderman, & Anderman, 2006). However, the patterns above referred offered a starting point for designing studies aimed at answering the two original questions. This answer is important because if motives and motivational orientations play a significant role as modulators of teaching patterns motivational value, as it seems to be the case, then professors should try to know their students' motivational profiles to decide how to enhance learning motivation.

#### Motivational characteristics

Several studies and recent reviews (Eccles & Wigfield, 2002; Meece, Anderman, & Anderman, 2006; Valle et al., 2006) have summarized research on the motivational characteristics that affect student interest and effort to learn and that can act as modulators of teaching pattern effects. Three *motivational orientations* — Learning, Outcome (or Performance) and Avoidance— that encompass more specific motives are well established according to motivational literature. Evidence on a fourth one —Learning

Avoidance— (Elliot & McGregor, 2001) is less concluding. However, research carried out in Spain on university student's motivation using multivariate techniques has allowed the identification of only two of the motivational orientations, as *Outcome Orientation* and *Avoidance Orientation* seem to be related in university students (Alonso-Tapia, Montero, & Huertas, 2000). In fact, there are data showing that these motivational dimensions, though separable, tend also to correlate positively at lower school levels and when assessed with different questionnaires (Alonso-Tapia, 2005). Moreover, recent research makes advisable to consider motivational orientations as integrated by specific motives that are substantially correlated but that cannot be confounded, some of which had not been considered in previous literature as facets of such orientations (Alonso-Tapia, 2005; Boekaerts et al., 2006). So, we considered acceptable for the purpose of the present study to assess the two motivational orientations that had been identified in Spanish studies, and the specific motivational variables underlying them according to the structure of the assessment instruments available, as they could act as modulators of the motivational efficiency of teaching patterns and decided to test such possibility.

Generally speaking, it can be expected that the teaching patterns just described contribute positively to students' strivings to learn. However, previous studies have shown that data not always support this general prediction (Alonso-Tapia & López, 1999). It seems that the previous level of student's motives modulates the motivational impact of teaching patterns. According to such studies, the following predictions related to motivational orientations and the specific motives underlying them were made:

- a) *Learning orientation*. It can be expected that this motivational orientation, as well as the specific motivational variables underlying it —*Learning motivation, Disposition to effort, Desire of public success, Lack of interest in academic tasks (this variable correlates negatively with the others), and, in less degree, Desire to avoid being overcome by time pressure*—, will correlate positively with the attribution of positive effects on personal strivings to learn to most teaching patterns whose subjective motivational effect will be studied since, according to theory, they all favor meaningful learning and the increase of personal competence.
- b) *Outcome-Avoidance orientation*. The main specific factors underlying this motivational orientation are *Desire of public success, Desire of external rewards, Fear of failure, Lack of interest in academic tasks*, and, in less degree, *Desire to avoid being overcome by time pressure*. Given this motivational structure and according to previous studies (Alonso-Tapia & López, 1999), different effects can be expected. On one hand, it can be expected that situations maximizing the possibility of obtaining public success will favor interest and personal strivings as the first motive increases. On the other hand, as far as students confront academic work looking mainly for external benefits not directly tied to the nature of task and learning activities, with high fear of failure or lack of interest in academic tasks, it is probably that they perceive professors' proposals and teaching patterns as undermining motivation, even if such proposals are made to improve understanding and learning, because they demand usually more effort.

## Method

### Participants

A total of 1166 university students coming from different faculties of two universities of Spain participated in this study. There were 576 males and 590 females. The mean age was 21.41 (SD 2.7). They belonged to five different courses (1<sup>st</sup>: 136; 2<sup>nd</sup>: 579; 3<sup>rd</sup>: 105; 4<sup>th</sup>: 291; 5<sup>th</sup>: 55).

### Materials

In order to identify the amount of interest and learning motivation that each particular teaching or learning activity aroused in students, the questionnaire *EMQ* (Environment Motivational Quality, Alonso-Tapia & López, 1999) was used. In this questionnaire students are shown descriptions of some classroom situations depicting teaching patterns that can be expected to have positive effects on learning motivation, and they have to indicate, in a *five-point* scale, the degree in which such patterns motivate them to strive for understanding and mastery, and not only for passing examinations. They are also presented items describing motivational reactions to different teaching patterns and they have to declare their degree of agreement with the content. Answers to positive and negative items were combined in order to get scores for each of the variables.

The EMQ questionnaire allows the analysis of subjects' evaluation of teaching pattern motivational value at three levels: a) at the level of specific pattern (items), b) at the level of group of patterns related to different facets of teaching such as introduction of topics and activities, planning and development of learning and teaching activities, etc. (scales), and c) at the level of teaching dimensions identified through confirmatory factor analysis. According to this analysis, scores on the different scales of teaching patterns can be grouped in three dimensions: a) teacher's activity has primacy (it depends on scales A-B-C-G), b) students' activity has primacy (it depends on scales D-E-F), c) motivational characteristics of assessment (it depends on scales B-E-H-I) (Alonso-Tapia & Ruiz, 2005). Moreover, as dimensions correlate, it is possible to derive a total score that defines the general teaching style assessed by the questionnaire. The scales derived, and their reliability, are shown in table 1.

Second, in order to assess specific motives and motivational orientations related to learning we have used the MAPE-III questionnaire. This questionnaire includes 111 items grouped in seven scales. These are of three kinds: A) *Scales related to goals* that students try to achieve or avoid: 1) Learning motivation (Reliability:  $\alpha = .756$ ), 2) Desire of public success ( $\alpha = .809$ ), 3) Fear of failure ( $\alpha = .856$ ) and 4) Desire of extrinsic rewards ( $\alpha = .809$ ); B) *Scales related to the amount of effort* usually realized when working and to the degree of acceptance of this work: 5) Disposition to effort ( $\alpha = .731$ ) and 6) Desire to avoid academic tasks because of lack of interest ( $\alpha = .765$ ); C) *Scales related to positive activation and effort generated by environmental pressure*: 7) Desire to avoid being overcome by time pressure ( $\alpha = .787$ ). In previous CFA two second order dimensions had been identified, *Learning Orientation*, and *Outcome and Avoidance Orientation*.

### Procedure

The following analyses were carried out in order to answer the questions asked:

- a) *Descriptive analysis.* Mean and standard deviations of scores in the specific variables of the EMQ, and of scores in its scales and dimensions were calculated. In these two last cases, scores were transformed into a 5 point scale in order to make easier the comparison and interpretation of results, as 1 to 5 was the scale in which subjects had answered, and each point had a qualitative adjective assigned to it («This pattern motivates me to strive for understanding and mastery (1) nothing, (2) just a few, (3) enough, (4) quite a lot, (5) completely»). Thus, mean values show the degree in which students as a group, with independence of their particular motivations, consider that teaching patterns are motivating.
- b) *Regression analyses.* Two groups of analysis were carried out. In both cases, scores in EMQ *dimensions* were the criteria. Predictors, however, were different: *motivational orientations* in the first group and *specific motivational variables* in the second.

### Results

#### First part: Motivational value of teaching patterns assessed

Table 1 shows mean scores reflecting the motivational value attributed by students to groups of patterns related to different facets of teaching (scales A to I), to teaching dimensions (D1 to D3) and to the teaching style defined by the whole set of teaching

patterns included in the EMQ (Scale T). Table 1 shows also the reliability indexes of each scale. Due to space limitations, data corresponding to specific teaching patterns have been omitted.

The mean motivational values range from 3,21 to 4,04 over 5. According to the adjectives defining scale points, this fact means that the effect of such patterns on motivation is *positive* — between *enough* and *quite a lot— but not too high*—. These results may be due to the modulating role played by student's motivations on the attribution of motivational value. However, before considering this possibility, several results must be pointed out as neither all the scales nor the specific teaching patterns included in each of them are valued in the same way.

First, the scale with the highest value is H —«Assessment conditions favoring learning» (4,04)— whereas the scale I —«Assessment conditions increasing difficulty and stress»— has the lowest value (2,38), as it could be expected. Though not included because of space limitations, specific patterns included in these scales —assessing students frequently, giving the possibility of going through exams afterwards and using novel task for assessment as well as setting time limits— have similar scores too. Also, one of the specific teaching patterns with highest score is «to say at the beginning of an activity that it is relevant for passing an examination». These facts underline the importance of the assessment context as a key factor for motivating students.

Second, concerning the motivational value attributed to professor's activities, *students value quite positively* (above 3.65): the presentation of *new or surprising information* for activating curiosity, the fact of making explicit the concrete objectives of learning activities as well as the usefulness of learning a particular content, the use of images, illustrations and examples to facilitate the representation of information, professor's allowing to freely

Scales of Teaching Patterns	Mean	Sd
A <sup>1</sup> . <i>Teaching patterns used for introducing topics or activities.</i> (Reliability: 0,75)	3,67	,54
B. <i>Professors' messages given when introducing a learning activity</i> (Reliability: 0,71), showing the relevance of activity:	3,63	,70
C. <i>Professors' planning and development of teaching activities</i> (Reliability: 0,512)	3,31	,59
D. <i>Professors' ways of inducing students to publicly participate in classroom discussions.</i> (Reliability: 0,76)	3,21	,66
E. <i>Teaching patterns related to planning, development or execution of practical tasks and classes.</i> (Reliability: 0,73)	3,52	,53
F. <i>Teaching patterns related to practical projects to be carried out at home</i> (Reliability: 0,83)	3,30	,63
G. <i>In relation to support given to students</i> , the questionnaire assesses the motivational value attributed to being available to help students (Only one item)	3,42	1,13
H. <i>In relation to assessment conditions favouring learning</i> (Reliability: 0,60)	4,04	,54
I. <i>In relation to assessment conditions increasing difficulty and stress</i> (Reliability: 0,51)	2,38	,90
Dimension 1: Total evaluation of patterns related to introductory and explanatory activities. (Reliability: 0,81)	3,56	,46
Dimension 2: Total evaluation of patterns aimed at implicating actively students in learning. (Reliability: 0,87)	3,28	,47
Dimension 3: Total evaluation of patterns related to assessment characteristics. (Reliability: 0,76)	3,70	,43
T) <i>General scale</i> (Reliability: 0,90). Motivational value attributed to the whole set of patterns included in the questionnaire	3,45	,38

<sup>1</sup> The letter before each pattern scale will be used for identifying each variable when describing the results of the study

ask questions in class, professor’s availability to help students to carry out practical tasks, the fact that a professor allows the possibility of choosing topic for practical projects and that gives open guidelines for carrying out them.

Third, there are patterns that do not even reach the value of «enough» motivating (a score of 3). For example, the use of a technical vocabulary, supposedly more precise, the fact of asking students directly to answer questions in class, and the fact of carrying out practical projects only as a mean for learning, with no effect on marks.

In summary, though there are differences in the motivational value attributed to different teaching patterns, most valuations are positive «but not very high». This fact may depend on the modulating role played by students’ motives. A teaching pattern that can motivate a student to learn could have the opposite effect on others with a different motivational profile. So, as mean scores are the result of mixing the valuations from different students, the motivational effect of teaching patterns can be obscured. To clarify this possibility, the regression analysis whose results are described next were carried out.

*Second part: Motivational value of teaching patterns associated to students’ motivation*

Regression analyses were realized in order to determine the relative weight that motivational orientations and specific motivational factors contributing to them have as potential moderators of teaching patterns motivational effects. Tables 2 and 3 show the results of regression analyses. As it can be seen, all of them have been statistically significant.

If we consider, in the first place, how the motivational value attributed to the *general teaching style* (Scale T) defined by the set of specific patterns included in the EMQ relates to *motivational orientations*, R reaches a value of 0.450, highly significant ( $F_{2,1163}=147.49$ ;  $p<.0001$ ). Both predictors —*Learning Orientation* and *Outcome-Avoidance Orientation*— have significant weights but the sign is opposite, positive in the first case and negative in the second. R reach a value even greater when predictors are the specific motivational variables assessed through the MAPE-III ( $F_{7,1158}=51.47$ ;  $p<.0001$ ). However, in this case *Disposition to effort* and *Positive reaction to time pressure* do not add significant weights.

*Table 2*  
Motivational value of teaching patterns as a function of students’ motivational characteristics. Regression analyses using *motivational orientations* as predictors

Criteria: Group of teaching patterns assessed	Regression <sup>1</sup>	Predictors: Motivational orientations	
		Learning Orientation	Outcome-Avoidance Or.
T) Total evaluation of teaching patterns (Assessment patterns not included)	R: .450 p<.0001	β: .297 p<.0001	β: .290 p<.0001
D1) Total evaluation of patterns related to introductory and explanatory activities	R: .357 p<.0001	β: .286 p<.0001	β: -.176 p<.0001
D2) Total evaluation of patterns aimed at implicating actively students in learning	R: .436 p<.0001	β: .238 p<.0001	β: -.326 p<.0001
D3) Total evaluation of patterns related to assessment characteristics	R: .341 p<.0001	β: .199 p<.0001	β: -.245 p<.0001

<sup>1</sup> R: Multiple Correlation. p: Probability. β: Standard Regression Coefficient

*Table 3*  
Motivational value of teaching patterns as a function of students’ motivational characteristics. Regression analyses using specific motives as predictors

Criteria: Teaching patterns	Regression	Predictors: Specific motivational variables						
		PRP	LM	DEF	LIAT	DPS	DER	FOF
T	R: .487 p<.0001	β: .045 P<.098	β: .292 p<.0001		β: -.140 p<.0001	β: .159 p<.0001	β: -.177 p<.0001	β: -.142 p<.0001
D1	R: .375 p<.0001	β: .062 P<.033	β: .224 p<.0001	β: .058 p<.053	β: -.129 p<.0001	β: .109 p<.001	β: -.131 p<.0001	
D2	R: .485 p<.0001	β: .047 P<.084	β: .267 p<.0001		β: -.112 p<.0001	β: .129 p<.0001	β: -.181 p<.0001	β: -.198 p<.0001
D3	R: .396 p<.0001		β: .268 p<.0001	β: -.070 P<.017	β: -.109 p<.001	β: .142 p<.0001	β: -.153 p<.0001	β: -.091 p<.003

<sup>1</sup> T: Total evaluation of teaching patterns (Assessment patterns not included). D1: Total evaluation of patterns related to introductory and explanatory activities. D2: Total evaluation of patterns aimed at implicating actively students in learning. D3: Total evaluation of patterns related to assessment characteristics. PRP: Positive reaction to time pressure LM: Learning motivation; DEF: Disposition to effort; LIAT: Lack of interest in academic tasks; DPS: Desire of public success; DER: Desire of external rewards; FOF: Fear of failure. R: Multiple Correlation. p: Probability. β: Standard Regression Coefficient

A very similar picture emerges, in the second place, if we consider how the motivational value attributed to the three dimensions of environmental patterns defined by professor's activities (Variables F1 to F3) relate to motivational orientations when used as predictors with some exceptions. *Positive Reaction to Pressure* contributes in a positive and significant way to predict the motivational value attributed to introductory and explanatory activities (F1), and the same does *Disposition to Effort*. This last variable contributes also in a positive and significant way to predict the motivational value attributed to assessment characteristics (F3). *Fear of Failure*, on its side, does not contribute in a negative a significant way to predict the motivational value attributed to F1.

#### Discussion and conclusions

At the beginning of this study two questions were formulated: What motivational value do students attach to different teaching activities? In what way do individual differences in goal orientations —or in the specific motives or needs underlying such orientations— modulate the degree of motivation enhancement achieved by instruction designed according to such models? The answer to these questions gives support to our initial predictions, though it is necessary to make a few points.

First, we decided to study the motivational value attributed to *only a subset of teaching patterns* supposedly affecting student's motivation. We did not study, for example, the motivational value of ways of teaching specific subject matters to make easy conceptual understanding and change, or the acquisition of procedural knowledge. In the same way, we have not asked about the motivational value of using computer programs supporting the construction of conceptual maps or the visualization of abstract processes, of working by projects or of experiencing new assessment modes —portfolios, etc.— (Struiven, Dochy, & Janssens, 2003). This fact has to be taken into account in order to put our results in the correct perspective: they are only a first study of this kind aimed at enlightening university student' motivational evaluation of teaching patterns.

Second, our results have shown that, according to students' point of view, most of the teaching patterns assessed, taken together and apart from students' personal motives, seem to have a net positive effect —though in some cases not very high— on students' interest and personal strivings to learn. For example, assessment conditions favoring learning are among the patterns most positively valued, a fact that underlines the importance of the assessment context as a key factor for motivating students and that points directions for improving assessment patterns. Examples of other variables valued positively are the presentation of *new or surprising information* for activating curiosity, the fact of making explicit the concrete objectives of learning activities as well as the usefulness of learning a particular content, the use of illustrations and examples to facilitate the representation of information, etc.

At least two facts could explain these results. First, most of the teaching patterns just referred contribute to clarify specific goals and to underline their importance, thus favoring goal commitment. Second, some of such patterns make students feel that they *can* reach their learning objectives, a feeling that raises students' perceptions of self-efficacy. Therefore, the continuous use of all these patterns will probably enhance students' strivings to improve their learning and capacities. These results are very similar to results

found in previous studies with Secondary and High-School students (Alonso-Tapia & López, 1999; Alonso-Tapia & Pardo, 2006).

Third, our results show that there are teaching patterns whose perceived effect on students' motivation is negative as, for example, assessment characteristics that increase task difficulty and personal stress. It seems reasonable to think, then, that if these patterns were avoided —for instance, if examinations were substituted by portfolio assessment—, students might feel better and their motivation to learn could improve. Nevertheless, there are important reasons for not changing some of these matters as, for example, the use of assessment tasks that imply active thinking and not only rote learning or the mechanical application of rules. So it would be worth considering whether a different instructional and assessment context, less oriented to assessment and more to favoring the experience of learning and progress, would change the motivational effect of such patterns from the point of view of the own students.

Fourth and *most important*, as the general hypothesis that gave place to this study suggested, regression analyses have shown that there is a strong association between students' motivational characteristics and the motivational value that they attribute to different teaching and assessment patterns. Ames (1992) and Meece et al. (2006) have summarized research showing the kinds of teaching patterns more suitable for improving motivation and effort to learn. However, according with our results, the effect of such environments is associated to —and probably mediated by— students' motivational characteristics. In the same way, our specific hypotheses related to this association have also received strong support from our data. However, the degree and kind of relationship between motivational variables (predictors) and the motivational value attributed to teaching patterns (criteria) vary according to the level of generality considered —motivational orientations versus specific motives, and general teaching versus groups of teaching patterns. These results parallel those found in the similar studies carried out with Secondary and High School students in which specific teaching patterns were also used as criteria in regression analyses.

The variation just mentioned has important implications for understanding the nature of motivational orientations and for guiding instructional practice. According to our results, *Learning Orientation* and *Outcome-Avoidance Orientation* are multifaceted in the sense that they are a summary of several motives that seem to interact in different ways —sometimes, opposite ways— with learning environment characteristics. Thus, *motives associated to Learning Orientation are not substitutable* because, though *learning motivation* is the most important, in many occasions —in relation to different teaching patterns— the students' motivation increases in response to stimulus that specifically activate other motives (Boekaerts et al., 2006). For example, a message or a learning experience showing the possibility of achieving public success can activate this specific motive and, as a consequence, the learning environment would be evaluated as being more motivating that if this specific motive had not been activated. And the same could be said in relation to motives associated to Outcome-Avoidance orientation. In consequence, university professors should know the specific kinds of action useful for activating specific motives in order to maximize interest and personal strivings.

Fifth, an important result has to do with the meaning of the negative relations found between many teaching patterns, considered in isolation or grouped, and the motivational variables

related to Outcome and Avoidance orientation. As motives such as *Fear of failure* or the *Desire to achieve rewards external to academic tasks* increase, many teaching patterns that supposedly favor learning progress and learning motivation seem to have just the opposite effect, according to students' evaluations. These negative relations are problematic especially when Learning

orientation and its related motives are low. In these cases, it is necessary to look for motivational strategies different from those suggested in the motivational literature and adequate for pulling students to learn activating any other of the multiple goals that, according to Boekaerts et al. (2006) have to be considered to improve motivation and learning.

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