Training strategies for self-regulating motivation and volition: effect on Learning

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Título: Entrenamiento en estrategias de autorregulación de la motivación y la volición: efecto en el aprendizaje.
Resumen: El objetivo del presente trabajo es comparar el efecto relativo y combinado en la autorregulación y en el aprendizaje que puede tener enseñar a los alumnos dos tipos de estrategias de autorregulación, unas centradas en la regulación de la motivación y otras centradas en el control de las emociones que afectan a la volición. Con este fin se desarrollaron dos tipos de guiones con instrucciones y comentarios que el profesor debía dar a los alumnos antes, durante y después de las tareas de aprendizaje. Las tareas utilizadas fueron de tipo académico –redacción- y no académico –solución de problemas de un rompecabezas chino, el Tangram. Un total de 178 estudiantes de Secundaria, con edades comprendidas entre los 16 y 19 años (*M*: 16,7) participaron en el estudio. Los resultados de los *ANOVAS* pusieron de manifiesto que la eficacia de cada tipo de entrenamiento varía dependiendo del tipo de variable dependiente utilizada, si bien -en general- fue mayor en el caso entrenamiento centrado en la autorregulación emocional. Se comentan las implicaciones teóricas y prácticas de los resultados.
Palabras clave: Motivación para aprender; volición; autorregulación; entrenamiento en autorregulación.

Abstract: The objective of this work is to determine the relative and combined effect on self-regulation and learning of teaching students two kinds of self-regulation strategies, the first centered on motivation, and the second on negative emotions that obstruct volitional processes. Two guides with instructions and commentaries that the teacher should give to students before, during and after learning tasks were developed. The learning tasks were also of two kinds, academic –writing composition- and non- academic –learning to solve problems of the Tangram, a Chinese puzzle-. A total of 178 High School students, 16 to 19 years old (Mean: 16.7) participated in the study. Results of ANOVAs showed that the efficacy of each kind of training varies depending on the dependent variable, though –in general- emotional self-regulation training was superior. Theoretical and practical implications of these results are commented.
Key words: Learning motivation; volition; self-regulation; self-regulation training.

Introduction

Teachers say often that students do not learn because they lack enough motivation, that is, because they consider that the goals to achieve are not worth to devote time and effort. Though this assertion is true according to expectancy-value theory (Eccles & Wigfield, 2002), according to this same theory what sometimes happens is that they do not have the necessary motivation because do not experience progress when trying to learn, as they do not know how to manage their learning process. This fact implies that the lack of adequate self-regulation influences negatively their self-efficacy expectancies –the belief that they are able to cope with the task in an efficient and successful way-, and through these expectancies, their learning effort that does not depend only on motivation. The learning effort depends on the way students self-regulate their learning process when confronting the task, and not only on motivational factors. Therefore, it is important to study the factors on which self-regulation depends, as the many studies on this topic show (Bjork, Dunlosky & Kornell, 2013; Dweck % Master, 2008; Efklides, 2011; Fryer % Elliot, 2008; Usher & Pajares, 2008; Shunk, 2008; Wigfield, Hoa, & Kaluda, 2008; Zimmerman, 2008, 2013; Zimmerman & Shunk, 2008), and how it can be improved.

To answer the above problem it is necessary first to clarify what does self-regulation mean. Self-regulation (SR) is a self-initiated cyclic process through which students: 1) self-represent the task, 2) decide to carry it out or not depending on their interests, on whether they perceive they have enough knowledge and capacity for doing it, and on their success expectancies, 3) plan the way to realize it, 4) self-monitor and self-assess whether they are doing it well or not, 5) cope with difficulties and emotions arising during its realization, 6) decide to modify their strategies to solve the task if necessary, or to give it up, 7) assess their performance and attribute their outcomes to different causes (Efklides, 2011; Winne, 2011; Zimmerman, 2008).

Self-regulation is, then, an essential competence to achieve deep learning and success. However, there are important differences in the way in which the cognitive, emotional, motivational and behavioral activities that configure the self-regulation process are managed (Boekaerts, 2011; Efklides, 2011; Zimmerman & Shunk, 2011a).

In the first place, students differ in the speed with which they decide to begin doing a task or not, and how to carry it out, depending on the interaction of different variables in which they differ: interests, previous knowledge, perceived self-efficacy for doing the specific task, goals used for self-representing and valuing it, competence, control and success expectancies (Efklides, 2011), and volitional orientation, the "action" or "state" orientations that translate the way they react when confronting preoccupation, negative emotions and distractions experienced when doing the task (Kuhl, 2000).

Once the students have decided to begin doing a task, they go on without interruption unless the process is interrupted by difficulties: lack of time, of previous knowledge, of cognitive strategies, etc. Becoming aware of such difficulties depends, in some way, on self-monitoring and self-assessment, processes in which students differ depending on their interest, on their motivation, and on the criteria they

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are using for assessing the procedure they are carrying out (Alonso-Tapia & Panadero, 2010). Besides, students differ in the way of coping with difficulties depending on their motivation (intrinsic or extrinsic), on their motivational orientation (Linnenbrink-Garcia et al, 2012; Senko, Hulleman y Harackiewicz, 2011), on their self-efficacy expectancies (Bandura, 1997), on the strategies available and, mainly, on their volitional orientation (Kuhl, 2000). These differences influence the way of reconsidering their decision of going on with the task or of giving it up.

Finally, if students go on with the task and finish it, they differ in how they evaluate their performance as a function of the available standards, of the attributional processes, of the reassessment of their competence and self-efficacy, of self-reinforcement, (Weiner, 1986), and in the speed with which they disconnect from the task and change to a new one or, by the contrary, they remain ruminating on their failures. These processes characterized also the mentioned volitional orientations (Kuhl, 2000).

The facts just described have provided a base on which to act in order to help students to acquire self-regulation patterns that improve their motivation and learning. In fact, many researchers have tried to do it on the base of a wide body of knowledge on self-regulation functioning and on the procedures available for improving it (Dignath & Büttner, 2008; Dignath, Büttner & Langfeldt, 2008; Perry & Rahim, 2011; Stoegler & Ziegler, 2011; Zimmerman & Schunk, 2011b).

An important review of such works is the meta-analysis realized by Dignath, Büttner and Langfeldt, (2008). In this work, the results of 48 intervention studies carried out between 1991 and 2006 for promoting self-regulated learning in students 5 to 12 years old were analyzed. A total of 263 measures were used for estimating the mean size effect of interventions as a function of different variables, being the most important: a) type of subject –reading, writing, mathematics and others (natural and social sciences); b) moderating variables (type of strategy trained: metacognitive, cognitive or motivational; c) duration of training; and d) students' age, among others. Results showed that an intervention can facilitate the development and use of self-regulation if it combines the training of metacognitive strategies –if students have taught to decide when and why to act in a particular way-, of cognitive strategies –if students are taught the specific process to use adequate for each subject-, and of motivational strategies –the strategies that are adequate for improving interest and motivation-.

In the case of Secondary students, similar reviews have not been found, though there are some studies. For example, Pardo and Alonso-Tapia (1990) trained cognitive and motivational strategies with similar results, though the training was carried out in an experimental setting, not in the classroom context. Besides, they did not teach to self-regulate ways of coping with emotions arising from difficulties. In fact, it seems from the revised research that there are no studies realized with Secondary students focused on im-

proving the processes implied in emotion self-regulation and, through it, on improving volition and learning self-regula-tion, and that compare the efficacy of training these processes with the efficacy of training the metacognitive and cognitive processes that were the focus in the studies revised by Dignath and Büttner, (2008). Teaching to self-regulate emotional and volitional processes is important because when students confront their school tasks they do not only tray to learn, but also to feel good, as pointed by Boekaerts and Corno (2005).

The objective of this work is, then, to analyze the relative efficacy of training self-regulation: 1) by teaching cognitive strategies focused on improving motivation, or 2) by teaching strategies focused on emotion control. Taking into account the results of the studies reviewed by Dignath and Büttner (2008) as well as the ideas of Boekaerts and Corno (2005), it can be stated as *starting hypothesis* that probably both types of training will have positive effects. However, the question of which type of training will be more effective remains open. Effectiveness may depend on interaction between task conditions and students' characteristics. Nevertheless, it may be that the combination of both types of training is more effective than the separate used of each one of them, or than the lack of training.

Method

To test the hypotheses, two similar studies were carried out. The only difference between them was the type of task. In one study, students had to realize an academic task –writing-, whereas in the other study they had to realize a non-academic one: they have to solve a Chinese puzzle, the Tangram, described later.

Participants

A total of 178 Secondary students, 16 to 19 years old (Mean = 16.7; *SD* = .66), 52% females and 47% males, participated in the study. They were chosen by convenience reasons form an urban center of Arica (Chile). They belonged to lower-middle social class, with a high index of socioeconomic and social vulnerability. The school authorities and the students' parents gave their consent for the study. Students were not randomly assigned to each study condition. So, it was tested before whether there were differences between groups in some moderating variables that will be described later.

Design

To test the hypotheses, it was used in both studies a 4 x 2 randomized block design with repeated measures (four kinds of treatment by two measurement occasion –before-after-) (Ato, López & Benavente, 2013). Intact classroom groups were used, but each group was randomly assigned to one of four training conditions: no training (control group),

motivational training, volitional training and mixed training. In the first study, training effects were assessed on three dependent variables related to the academic task (quality, number and variety of arguments), whereas in the second study, the dependent variable for assessing training effects was performance in Tangram. In order to control the effects of potential outcome moderator variables that were not the object of intervention, the following variables were measured: age, sex, IQ, motivational orientation and volitional orientation.

Materials

A) Materials for intervention.

1) *Instructions.* Two types of instructions were used for intervention. First, *classroom instructions* for each of the studies. In the first study these instructions defined the argumentation tasks that the students had to realize, whereas in the second, they described the nature of the puzzle to be solved. Second, the specific instructions defining the experimental conditions. As these instructions were quite long and were inserted in the classroom script, a complete transcription is impossible. So, only some examples will be presented (The whole set of instructions can be seen in: http://sohs.pbs.uam.es/documentos/entrenamiento_en_a utorregulacion.pdf).

a) *Control group.* There were no specific instructions, only the classroom instructions used for motivating all the students and explaining the task.

b) *Motivational training group.* The instructions for this group were aimed at activating the learning motivational orientation and to facilitate the self-regulatory processes supporting this motivation on the base of the type of training developed by Pardo & Alonso-Tapia, (1990). The following messages are examples of these instructions: *Before the task:* "Who would not like to be able to convince other people? We are going to learn how to convince, as this consist of a technique that can be learned". *During the task:* "You will be able to do it better if you plan your way in advance and try to it dividing the problem in parts". Or, in case that the student found a difficulty: "Try to look for an alternative procedure: there are always different possibilities. Remember, if you progress in solving the exercises, you are going to feel proud, as it is the reward for learning from errors". *After the task:* "What have you been thinking about as you were trying to realize the exercises on argumentation? What type of ideas have been useful? Why do you think so? What ones have not been useful? Why do you think so? What are the differences between the two types of ideas"

c) *Volitional training group.* The instructions for this group were aimed at activating the *action orientation* and through it, the *positive emotion self-regulation*. With this purpose, *before* the task, students received instructions such as: "Do not

detain too much considering what exercise to do: you will learn the same no matter the one you chose. Star going the exercise without hesitation". *During the task*: "If you feel discouraged because the task is difficult, try to thing on the things that you are doing well: you will be able to bounce back", "If you feel tense, take a deep breath: you will feel relaxed". *After the task:* There were no specific messages aimed at controlling emotions.

d) *Mixed training group.* Students in this group received, combined, the two types of instructions given to the students in the two previous conditions.

2) *Task materials.* In the first study, focused on learning how to write argumentative texts, students had available the support materials usually employed for this task, mainly texts. In the second study, it was used the Tangram, a Chinese puzzle. The objective of this task is to reproduce the figure shown in a silhouette using the seven pieces of the puzzle living no one. Figure 1 shows the silhouettes used for training. Performance in this task was scored from 0 to 5, depending on the number of pieces correctly placed.
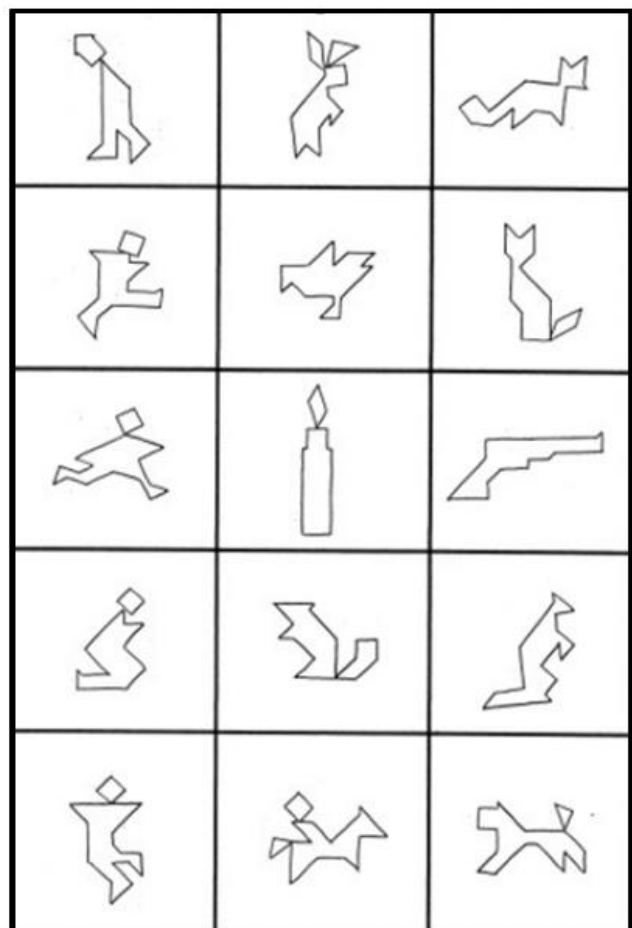

Figure 1. Tangram silhouettes used for training.

B) Materials for assessing the moderating variables.

As there are differences in self-regulation that depend on motivation (Alonso-Tapia, Huertas y Ruiz, 2010) and volition (Kuhl, 2000), and as both types of variables manifest in the self-messages that students give themselves when confronting a task, in order to control for the potential moderating effect of these types of messages on learning, the following questionnaires were used:

- *MEVA questionnaire, abbreviated form (Alonso-Tapia, 2005).* This questionnaire includes three scales that allow assessing the three goal orientations more accepted, according to motivational literature (Elliot, 2005): Learning goal orientation ($\alpha = .84$), Performance goal orientation ($\alpha = .71$) and Avoidance goal orientation ($\alpha = .72$).
- *HAKEMP-90 (Kuhl, 1994), Spanish version.* This questionnaire includes also three scales that allow assessing the volitional orientations to state or to action through three bipolar scales related the degree of attention focused on emotional states at the beginning of activities (initiative vs vacillation, $\alpha = .77$), during activities (persistency vs volatility, $\alpha = .77$), or once the activities are finished (resolution versus preoccupation, $\alpha = .67$).
- *Motivation self-messages questionnaire (MSQ)* (Alonso-Tapia, 1995). It consists of two scales of self-messages of different motivational content: a) Positives self-messages oriented to learning ($\alpha = .77$) and Negative self-messages oriented to performance or avoidance ($\alpha = .90$).
- Two scales developed for these studies, *Success expectancies for the specific task*, with ten items ($\alpha = .76$), and *Interest in the task,* with four items ($\alpha = .74$). These scales were used because of the potential moderator value of the two variables.
- *Progressive matrices IQ test* (Raven, 1995). This well-known IQ test was used for controlling the potential moderator effect of this variable.

C) Materials for assessing the dependent variables. The following materials were used, one for each study:

- *Rubric for assessing the writing of argumentative texts.* This rubric consist of nine categories that allow assessing the quantity, variety and quality of arguments given for persuading in relation to the proposed topic. The categories were: a) number of arguments, b) variety of arguments, c) clarity of arguments, d) statements given in support of arguments, e) illustration of arguments with facts or examples, f) accuracy of statements, g) logic of sequence, h) conclusions and, i) adequate use of documental sources. Three scores were derived from this instrument: Number of arguments, variety of arguments and quality of arguments. The "Number" measure was obtained adding the number of reasons given by the students. The "Variety" measure took into account only the reasons that were really different and not those reasons that were a repetition or a paraphrase of a reason already given. As for the "quality "measure", it was derived using the following five criteria: 1) The answer reflects a

clear and well supported expression of the author's opinion (4 points); 2) it includes specific and relevant pieces of evidence (4 points); 3) it includes contra-arguments (3 points); 4) it present secondary ideas and data with accuracy (2 points); 5) the conclusion does not allow any doubt about the author's position (3 points). The scores obtained with this code were the measure of the dependent variables.

- *Tangram score.* Performance in this task was scored from 0 to 5 depending on the number of pieces of the puzzle correctly placed.

Procedure

The first study, realized in the context learning to write argumentative texts, was developed along three classes. Students worked in their ordinary classrooms, during school time, and individual tables. For the initial assessment, all participants realized the same tasks and received the same instructions, no matter the experimental condition to which they had been assigned. Later, during training, they received different information, depending on the experimental condition they belonged to.

The second study was developed along two classes. In the first class, devoted to the initial assessment, all the students received the same instructions, whereas in the second, each group received the instructions corresponding to the experimental condition assigned.

Data analyses

First, one-factor ANOVAS to test for differences between groups in each moderating variable were carried out. Second, repeated measures ANOVAS of dependent variables in academic and non-academic tasks were also carried out.

Results

Analyses of differences between covariables.

Table 1 shows the means and standard deviations of the four groups in all moderating variables. Only in one case – Avoidance orientation- the differences between groups were significant. Analyses of covariance realized after this result (not included) showed the moderating effect of this variable on results was non-significant. So, all data were reanalyzed with ANOVA.

Study 1. Analyses of intervention effects.

Table 2 shows the means and standard deviations in the three dependent variables before and after training, and Figures 2, 3 and 4, the ANOVA results.

Table 1. Means and Standard deviations of the potential moderating variables.

Covariables		Group A	Group B	Group C	Group D	MC	F	p
Age	M	16.74	16.66	16.69	16.77	0.11	0.25	.861
	SD	0.10	0.10	0.10	0.09			
Intelligence quotient	M	3.39	3.37	3.03	3.56	1.63	2.35	.075
	SD	0.15	0.14	0.14	0.14			
Learning orientation	M	102.22	106.41	102.53	108.45	312.48	2.53	.060
	SD	1.85	1.85	1.96	1.93			
Performance orientation	M	52.92	52.62	53.63	52.75	18.35	0.86	.461
	SD	0.74	0.75	0.76	0.75			
Avoidance orientation	M	36.32	35.65	33.08	33.62	89.82	4.48	*005*
	SD	0.73	0.69	0.75	0.75			
Action orientation when planning	M	7.00	6.97	7.06	6.82	0.39	0.05	.985
	SD	0.44	0.43	0.51	0.44			
Action orientation when executing	M	4.17	4.33	4.62	4.53	1.41	0.72	.537
	SD	0.22	0.21	0.25	0.22			
Action orientation after failure	M	3.69	3.61	4.75	3.84	8.86	1.71	.166
	SD	0.36	0.35	0.42	0.36			

Table 2. Means and Standard deviations of the dependent variables before and after training.

Type of task	Dependent variable	Occasion	Condition	M	SD	n
Academic task	Quality of arguments	Before	1	15.14	2.41	29
			2	15.50	3.01	34
			3	15.65	3.12	26
			4	13.63	3.44	24
			Total	15.04	3.05	113
		After	1	16.90	1.73	29
			2	17.26	2.60	34
			3	21.58	4.13	26
			4	17.75	2.80	24
			Total	18.27	3.40	113
	Number of arguments	Before	1	3.90	.97	29
			2	4.59	1.18	34
			3	4.73	1.07	26
			4	4.08	1.17	24
			Total	4.34	1.14	113
		After	1	5.10	.77	29
			2	5.88	1.32	34
			3	5.50	.99	26
			4	5.04	1.16	24
			Total	5.42	1.13	113
	Variety of arguments	Before	1	4.38	1.42	29
			2	4.56	1.10	34
			3	4.77	1.10	26
			4	4.38	1.27	24
			Total	4.52	1.22	113
		After	1	5.52	.78	29
			2	6.32	1.43	34
			3	5.69	1.12	26
			4	5.46	1.35	24
			Total	5.79	1.24	113
Non-academic task	Performance in Tangram	Before	1	2.23	1.28	31
			2	1.71	1.18	21
			3	2.04	1.33	23
			4	2.13	1.47	31
			Total	2.06	1.33	106
		After	1	2.29	1.07	31
			2	2.33	1.39	21
			3	4.00	1.97	23
			4	3.55	1.50	31
			Total	3.04	1.64	106

Figure 2 shows the results corresponding to the variable *quality of arguments*. In this case, the effects of *occasion* ($F_{1, 109}$ = 121.85; $p < .001$; η^2 = .528), *condition* ($F_{3, 109}$ = 7.48; $p < .001$; η^2 = .171) and *interaction* between both variables ($F_{3, 102}$ = 10.91; $p < .001$; η^2 = .231) were significant. All groups increased the quality of the argumentative text, but the *volitional training group* (group 3) had the highest improvement followed by the *mixed training group* (group 4).
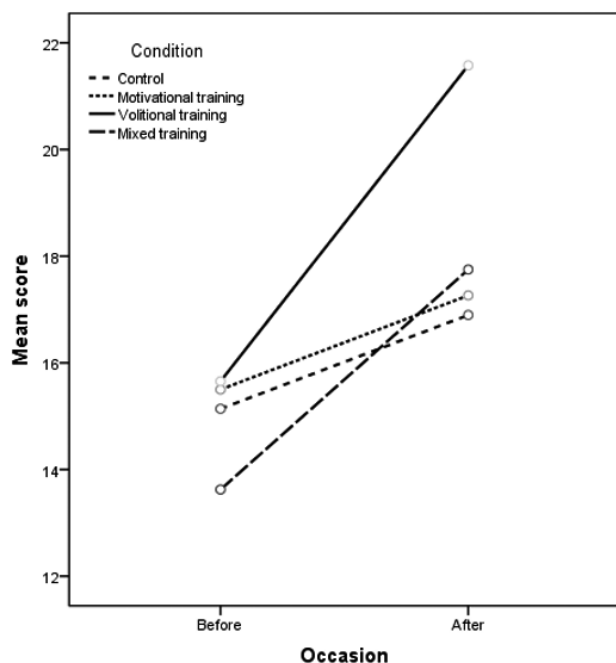

Figure 2. Differences in *quality of argumentation*.

Figure 3 shows the results corresponding to the variable *number of arguments*. In this case, the effects of both, *occasion* ($F_{1, 109}$ = 78.04; $p < .001$; η^2 = .417) and *condition* ($F_{3, 109}$ = 5.07; $p < .003$; η^2 = .122) were significant, but not the effect of the *interaction* between both variables ($F_{3, 102}$ = 1.02; $p < .385$; η^2 = .027). This fact implies that, though there are differences between subjects in the different conditions, these differences do not imply a change of the initial differences between groups: all types of training have had a positive effect in the number of arguments generated by the students, but no one of them had a differential effect on this variable.

Finally, Figure 4 shows the results corresponding to the variable *number of arguments*. In this case, the effect of *occasion* was significant ($F_{1, 109}$ = 96.37; $p < .001$; η^2 = .469), but neither the effect of the variable *condition* $F_{3, 109}$ = 1.75; $p < .116$; η^2 = .160)   nor the effect of the variable *interaction* ($F_{3, 109}$ = 2.45; $p = .06$; η^2 = .063) reached the standard level of significance.
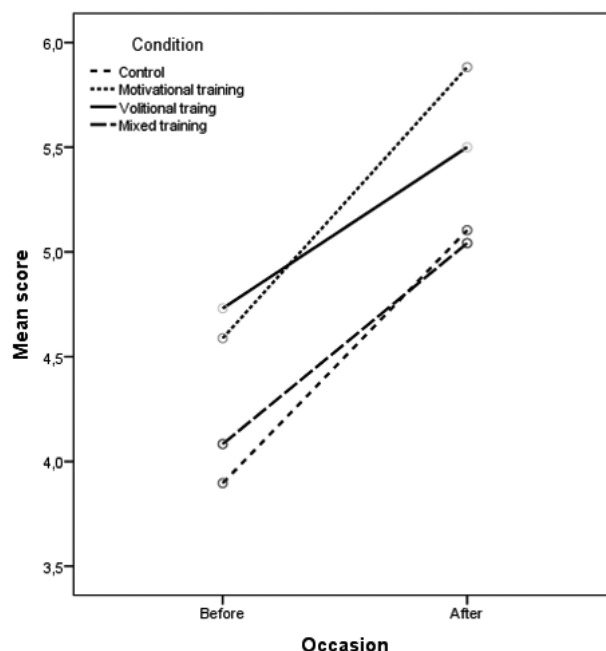

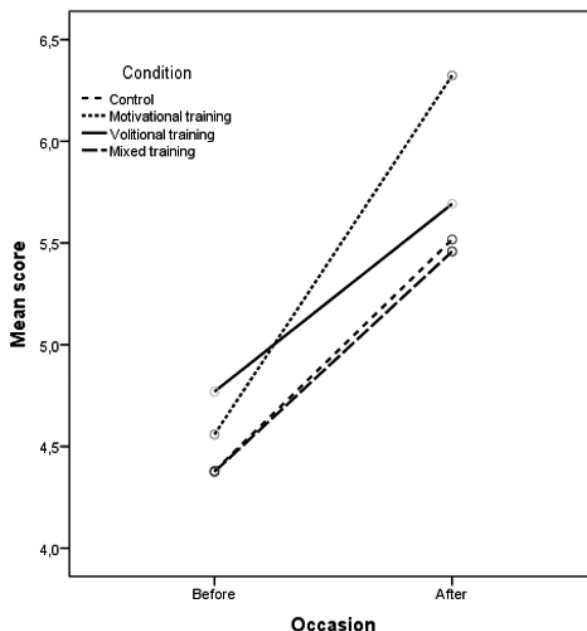**Figure 3.** Differences in the variable *number of arguments*.

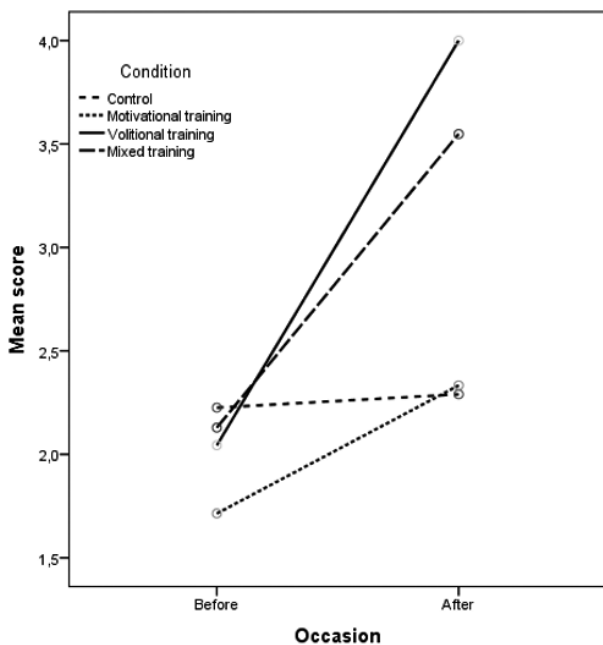**Figure 4.** Differences in the variable *variety of arguments*.

Study 2. Analyses of intervention effects

Table 3 shows the means and standard deviations in the dependent variable *Tangram performance* before and after training, and Figure 5, the ANOVA results. In this case, the effects of *occasion* ($F_{gl = 1, 102}$ = 37.33; $p < .001$; η^2 = .268), *condition* ($F_{gl = 3, 102}$ = 4.15; $p < .008$; η^2 = .109) and *interaction* between both variables ($F_{gl = 3, 102}$ = 6.65; $p < .001$; η^2 = .164) were significant. All groups increased the quality of the ar-

gumentative text, but the *volitional training group* (group 3) had the highest improvement followed by the *mixed training group* (group 4). As it can be seen in Figure 4, all groups except the control one improved their performance after training, but the groups with volitional training increased their performance in a degree significantly greater than the other two groups (Mixed training group: Difference = -1.42; $t_{gl = 30}$ = -5.69, p <.0001; Volitional training group: Difference : -1.95; $t_{gl = 22}$ = 4.42, p<.000).

Table 3. Means and Standard deviations in "*performance in Tangram*".

	Condition	Mean	*SD*	*n*
	1	2.23	1.28	31
	2	1.71	1.18	21
Before	3	2.04	1.33	23
	4	2.13	1.47	31
	Total	2.06	1.33	106
	1	2.29	1.07	31
	2	2.33	1.39	21
After	3	4.00	1.97	23
	4	3.55	1.50	31
	Total	3.04	1.64	106

Figure 5. Differences in the variable *performance in Tangram*.

Discussion and conclusions

At the beginning of this paper it was said that students' effort to learn does not depend only on their motivation, but also on the way of self-regulating their own activity when confronting the learning tasks. This fact underlies the importance of facilitating self-regulation. This process implies knowing specific strategies related to the task in hand, the capacity of regulating the own motivation by focusing on the value of learning what one is trying to learn, and the capacity

of coping with the negative emotions that arise when finding difficulties, as such emotions can force the students to give up the task. However, the review of self-regulation literature showed that there were no studies displaying the relative and combined effect that teaching to self-regulate not only motivation, but also the emotions affecting volition, can have on learning. The need of an answer to this problem motivated the present study. Thus, what kind of contributions has our study made for answering this question?

Before evaluating the results, we have to pay attention to the brevity of intervention, as this fact can explain why the results were not more pronounced. Having this fact in mind, the result most clear is that, contrary to initial expectations, the effect of both types of training has not been similar in both studies. The only relevant effect in both cases that was significant was the effect of volitional training, focused on teaching how to self-regulate emotions. However, in Study 1 this effect has not been found when the dependent variables were those that implied a lower mental effort –to give more and more varied arguments-, though it has been found in the case of the dependent variable *quality of arguments,* a variable that imply giving arguments more relevant and organizing better the argumentation. In the same way, in Study 2, the only dependent variable –*performance in Tangram*- implied complex reasoning processes.

These results raise some questions. Why volitional training effects, focused on self-regulating the negative emotions that influence volitional processes, do not generalize from one task to another? Why *motivational training* effects have not been significantly higher than those found in the control group, as it have been found in other studies? (Pardo & Alonso Tapia, 1990).

Concerning the first question, it may have been that, as the processes affecting the different dependent variables differ in difficulty, the experience of difficulty and the negative emotions aroused by it may have been also different: it is easier to give reasons –in great quantity and more varied- that to select them on the base of its relevance and, mainly, to organize them when building an argumentation. The greater the difficulty, the greater the likelihood of experiencing negative emotions that can manifest in thoughts such as: "What a difficult task!", "I don't know how to do it", "I'm going to be wrong", etc. In consequence, it is in these occasions when teaching strategies allowing the self-regulation of emotions can be more useful: that is what the results seem to imply. The teaching of such strategies would had allowed the students to cope adequately with the fear of making mistakes or doing wrong, to control their emotional states, anxiety and annoyance, and to generate positive thoughts. That is, it seems that a greater control of emotional states allow students to achieve greater concentration, attention, interest, effort and persistence in the task, so that their performance improves. On the contrary, it seems logical that if the task is not difficult and does not arouse negative emotions, to teach the students to self-regulate their emotions has few effectiveness.

The likelihood that the greater experience of difficulty have made it possible the greater effectiveness of emotion self-regulation training, increases if we consider that the time the students had available for realizing the tasks was quite limited –it was a very short intervention-. This fact could have aroused anxiety, and so the volitional training, directly aimed at teaching how to control emotions, would had been more effective.

As for the effect of *motivational training,* it was non-significant -the students in this condition improved, but their improvement was similar to that of the control group-. However, the effect was almost significant in the case of the dependent variable "variety of arguments" In both cases, the results differ from the ones found in other studies (Dignath & Büttner, 2008; Pardo & Alonso-Tapia, 1990). It is therefore appropriate to ask why the motivational training group was not superior to the control group. There may be several reasons. In study 1, the previous experience of students with the task of writing argumentative texts, a task already dealt with in previous years, may have influenced the value assigned to the task by the students so that intervention –given its brevity- would have been insufficient for improving their motivation. In the case of Study 2, the lack of previous experience should have been caused the improvement of motivation, as previous experience would not have interfered. However, the fact that the work took place in a school context, in which performance in a puzzle is not relevant, may have produced the results obtained. Finally, the fact that the effect of *motivational training* fell short of the standard levels of significance in the case of the variable "variety of arguments" could be explained if we consider the possibility that to look for different arguments may not generate too much anxiety. In this case, volitional training would not be neither specially relevant nor effective, whereas motivational training, focused on strategies directly oriented to the realization of the task, would certainly be relevant and so, probably effective.

Another question aroused by our data is why, in the non-academic task, the volitional training was effective whereas the motivational was not, neither alone nor in combination, as there nor additional effect to that of volitional training. This fact could be explained on the base of some observations realized during training, when it could be appreciated that the students' motivation was mainly to win in competition. The situation aroused a motivation extrinsic to the task –to show their abilities to solve the Tangram (a circumstantial interest)-, and probably, greater anxiety –fear of failure-. In this case, the volitional training was relevant, whereas the fact that the task was not a curricular one did not activated the motivation to learn, that was what the motivational training tried to do.

Taken together, the results found make an important contribution. According to Boekaerts (2011; Boekaerts & Corno, 2005), students not only strive for learning, but also for wellbeing. So, if the learning environment is stressful by any reason –the type of task, the difficulty experienced, etc.-, their performance is negatively affected. For this reason, not only it is important to self-regulate learning and motivation, but also the emotions that affect volition and the whole self-regulation process. Our results support the idea that it is possible to teach how to self-regulate emotions in an effective way. Moreover, they also suggest, according to the self-regulation model proposed by Efklides (2011), that the type of task plays an important moderating role. It is not the same a difficult task that can generate anxiety, than an easy one; and it is not the same a task relevant for the objectives at stake –the performance in a task is important for achieving good grades-, that a task not relevant for such objectives. Therefore, if we what to progress in our understanding of how to help students to develop their self-regulation capacity, it is necessary to pay attention to the task and to the degree of experience of students in it.

The present work, however, has an important limitation. The intervention was short and so, the value of our conclusions is limited. So it is necessary to get additional evidence that give additional support to them.

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