

RELATIONS BETWEEN THE PERSONAL SELF-REGULATION AND LEARNING APPROACH, COPING STRATEGIES, AND SELF-REGULATION LEARNING, IN UNIVERSITY STUDENTS (PROCESS)

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<https://doi.org/10.17060/ijodaep.2014.n1.v4.601>

Fecha de Recepción: 15 Enero 2014

Fecha de Admisión: 30 Marzo 2014

RESUMEN/ABSTRACT

Introduction. Self-regulation is an important variable in education and research, but in educational context self-regulated learning is the construct more studied. For this, there are a scarcity of studies that seek to establish relationships between personal self-regulation and other educational variables. We aim to delimit the relationships between personal self-regulation (Presage variable) and different process variables: approaches to learning, self-regulated learning and coping strategies, establishing the importance of these variables in future research in meta-cognition.

Method. A total of 1101 students participated in the study (university and candidate students). The analyses made to meet the proposed objectives and test hypotheses were: Association analysis through Pearson bivariate correlations (*Association objectives and hypotheses*); linear regression analysis (*Regression objectives and hypotheses*); Cluster analysis, ANOVAS and MANOVAS, with Scheffé post hoc, and effect size estimates (*Inferential objectives and hypotheses*).

Results. A significant associative relationship appeared between self-regulation and learning approaches and self-regulated learning; and negative correlation with emotion-focused coping strategies. The different levels of personal self-regulation (presage learning variable) determine of the type of learning approach and of coping strategies.

Discussion and Conclusions. The importance of personal self-regulation that determines the degree of cognitive self-regulation during the process of university learning; the relationship between personal self-regulation and the type and quantity of coping strategies, and the relationship between self-regulated learning and coping.

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Palabras Clave: 3P Model, DEDEPRO Model, Personal Self-regulation, Coping strategies, Self-regulated learning.

1. INTRODUCTION

University education is undergoing a profound process of change, and the main exponent of this change is the European Higher Education Area (EHEA). The sweeping innovations driven by the creation of the EHEA have brought about new demands for both teachers and students, many of which are the product of a restructuring of the teaching-learning process (Biggs, 2001). In this process, students take on a more active role in constructing their own learning, and teachers must contribute to the construction of their learning by advising, orienting and helping them resolve difficulties that arise along the way (De la Fuente & Justicia, 2007). For this reason we have to study different variables (personal self-regulation, coping strategies and self-regulated learning) that form part of the teaching-learning context in this new context.

Personal self-regulation as a student presage variable

Personal self-regulation refers to the capacity or ability to control our own thoughts, emotions and actions. We can therefore affirm that personal self-regulation is a vital process that allows people to behave adequately, carry out tasks properly, and abstain from activities that may be harmful to their own livelihood (Baumeister & Heatherton, 1996). Self-regulation is used in a number of processes including the regulation of emotions, thoughts and actions for physical or behavioral control or restraint (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Vohs & Baumeister, 2011).

Within Miller and Brown's theoretical model for addictive behaviors (Miller & Brown, 1991), it is assumed that self-regulation is developed through seven successive processes: 1) *Informational input* (self-observation); 2) *In Self-evaluation*; 3) *Instigation to change*; 4) *Searching for options*; 5) *Formulating a plan*; 6) *Implementing the plan*; 7) *comprehensive assessment*. If there is a deficit in any of these self-regulation processes, one's behavior regulation will suffer. Within this theoretical framework, Brown (1998) defines self-regulation as a person's ability to "plan, monitor and direct his or her behavior in changing situations" (p.62), adopts the self-regulation postulates of Zimmerman (2002).

Prior studies have shown that self-regulation has a significant role in health as well as in success, whether academic or work-related (Karoly, Boekaerts & Maes, 2005; Vancouver & Scherbaum, 2008). We can think of the process of self-regulation as having a personal, behavioral and contextual nature (Bandura, 1986; Torrano & González, 2004), adding goals as a key factor (Latham & Locke, 2007; Winne, 2004). Taking personal regulation as a presage variable in the sphere of educational psychology, De la Fuente and Cardelle-Elawar (2011, p. 3) define it as a student variable "that determines the level of effort that students will sustain in the process of active learning for the completion of a given task". It is widely recognized as the means by which students transform their mental skills into problem solving survival skills (De la Fuente & Cardelle-Elawar, 2011).

Approaches to learning, coping strategies and self-regulated learning as a process variables

We have seen that the aim objective is the building of an empirical model of consistent relationships that establish conceptual relations between the *learning process* variables: determining how student presage variables (personal self-regulation), relate to process variables (coping strategies, approach to learning, self-regulated learning strategies) and product variables (performance and satisfaction); and the *teaching process* variables: determining how presage context variables (contexts of university education and preparation for competitive examinations) are related to and interact with these student presage, process and product variables. For this reason next we will do a brief summary about the three different process variables that for part of this investigation: approaches to learning, coping strategies and self-regulated learning.

Approaches to learning

Biggs (2001) defined learning approaches as the learning processes that emerge from students' perceptions of the academic task, and influenced by their personal characteristics. Inside the 3P (Presage-process-product) Model (2001, 2005) Biggs (1989, 1990) determine two learning approaches: 1) surface approach, that students are motivated instrumentally, pragmatically or extrinsically, and their main purpose is to meet the course requirements with the least effort. Thus, learning becomes a balancing act between avoiding failure and not working too hard and; 2) deep approach, that students are intrinsic motivation to understand and to enjoy learning. Thus, they adopt strategies that are most likely to help them satisfy their curiosity and their search for inherent meaning in the task. In recent decades there has been some research on approaches to learning (Sander, De la Fuente, Martínez-Vicente & Zapata, 2012). One line of research seeks to establish the relationship between learning approaches and academic achievement.

Coping strategies

We find ourselves at a very complex time socially, when the word stress plays a leading role in day to day life, and has become a familiar concept. When we speak about coping we refer to cognitive and behavioral efforts to manage stress (DeLongis, Holtzman, Puterman, & Lam, 2010).

Holroyd and Lazarus (1982) define coping as "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transaction" (p. 843). Lazarus (1991) defines coping as "cognitive and behavioral efforts to manage specific external or internal demands (and conflict between them) that are appraised as taxing or exceeding the resources of a person" (p. 112). There are a variety of coping strategies that have been proposed by researchers in order to understand the discrepancies in how individuals act when dealing with stressful situations. We proceed now to discuss different coping strategies and the theories that study them (Hobfoll & Schröder, 2001; Lazarus & Folkman, 1986). Coping strategies refers to behavioral and cognitive efforts that a person makes in order to deal with stress. In other words, these are strategies that one turns to in order to deal with either the external or internal demands that generate stress, as well as with the psychology discomfort that usually accompanies them (Sandín, 1995).

Coping strategies in the context of Educational Psychology are more related to academic stress and specifically to one of its main stressors, tests (Piemontesi & Heredia, 2009). We consider it of vital importance to inquire into coping strategies, since all university students must face the external stressor of tests, as well as others. We must also keep in mind that university students are a very specific population, as are the ways that they deal with stress. Hence, the importance of introducing this variable in the present research study, as mentioned above. Fewer studies have been carried out in this field, but relationships have been found between coping strategies and academic performance (Cohen, Ben-Zur & Rosenfeld, 2008) and student gender (De la Fuente, Cardelle-Elawar, Martínez-Vicente, Zapata & Peralta, 2013). In addition, students' levels of stress have been studied in conjunction with the coping strategies they use (Ticona, Paucar & Llerena, 2010).

Lazarus and Folkman (1986) consider one distinction to be extremely important: the difference between coping that is directed toward handling or altering the problem (*problem-directed coping*), and coping aimed at regulating the emotional response that the problem brings about (*emotion-directed coping*). The relevance of the present study is due to a lack of research on coping strategies in conjunction with other variables of Educational Psychology, such as learning approaches, performance and satisfaction with learning.

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Self-Regulated learning

The concept of self-regulated learning is emerging more from day to day, due to its great importance in the teaching-learning process. Specifically, this construct refers to a self-directing process in the students, transforming their mental ability into academic skills. Self-regulation is thus considered a proactive activity where the student takes the lead in helping himself, as well as developing learning strategies. For the definition of this variable, we must bear in mind the active role of students in the learning process, the feedback given to them during this process, and the role of motivation (Zimmerman & Labuhn, 2012).

Researchers who study this variable suggest that students self-regulate when they take an active role, at the metacognitive, motivational and behavioral levels, in their teaching-learning process (Zimmerman, 1986). All the definitions that are given to self-regulated learning include these three properties, which allow students to be aware of their own learning process and of the importance of improving their academic performance. But these are not the only components in the definition of this construct, we also find what are known as feedback loops during learning (Carver & Scheier, 2000; Winne & Hadwin, 1998; Zimmerman, 1989, 2000b). This refers to a cyclical process by which students direct the effectiveness of their learning methods or strategies to respond to feedback, with non-visible changes in self-perception as well as visible changes in behavior. The concept of self-regulated learning is a description of how and why students choose to use a self-regulated process in particular, a strategy or a response. The vast majority of researchers are in agreement that motivation has a role in prompting these results.

Sociocognitive theory emphasizes the interaction of personal, behavioral and environmental factors in self-regulated learning (Bandura, 1997; Zimmerman, 2002). These factors normally change during learning and must be monitored, hence self-regulation is considered to be a cyclical process. This cyclical nature is represented in Zimmerman's three-phase self-regulation model (Zimmerman, 1998): 1) *Forethought phase*: A prior phase that refers to processes that prepare the scenario for action, giving thought to processes that occur during learning and that affect attention and action. During this initial phase, there are two different areas: task analysis processes and self-motivation beliefs; 2) *Performance control phase*: Two major classes of self-regulation processes are postulated during this phase: self-control and self-observation; 3) *Self-reflection phase*: This phase takes place after execution; students respond to the efforts they have made, where greater effort compensates for fewer self-regulation processes throughout the different phases (Zimmerman & Labuhn, 2012).

2. OBJECTIVES AND HYPOTHESIS

The present investigation seeks to determine what relationships there may be between personal self-regulation (as a *presage variable of learning*) relates to learning approaches, strategies for coping with stress, and self-regulated learning (as *process variables of learning*). It was hypothesized that, based on previous evidence (De la Fuente & Cardelle, 2011), there would be a significant, positive association between personal self-regulation with deep strategy, problem-focused coping strategies and self-regulated learning. Likewise, an interdependence relationship between the two constructs was expected to appear.

3. MATERIALS AND METHODS

Participants

A total of 1101 students participated in the study, students at the University of Almería (Spain) and students who were preparing for competitive exams. Of the university students were pursuing a degree in Psychology, and School Psychology (*psicopedagogía*). The mean age was 23.08 years (SD=4.4).

Instruments

Personal self-regulation was measured using the *Short Self-Regulation Questionnaire SSRQ* (Miller & Brown, 1991) in its Spanish version, the CAR (De la Fuente, 2003a). It has already been validated in Spanish samples (Pichardo et al, in press), and possesses acceptable validity and reliability values, similar to the English version.

Learning approach was measured with The *Revised Two-Factor Study Process Questionnaire (R-SPQ-2F)* (Biggs, Kember & Leung, 2001), in its Spanish version (de la Fuente & Martínez-Vicente, 2003a). The R-SPQ-2F (Biggs, Kember & Leung, 2001) contains 20 items on four subscales (Deep Motive, Deep Strategy; Surface Motive and Surface Strategy), aimed to measure two dimensions: Deep and Surface learning approaches, respectively. Students respond to these items on a 5-point likert-type scale ranging from 1 (rarely true of me) to 5 (always true of me). Justicia, Pichardo, Cano and Berbén (2008) validated this questionnaire in a Spanish sample and showed a confirmatory factorial structure with a first order factor structure of two factors; they also reported acceptable reliability coefficients.

The *coping strategies* variable was measured using the *Escala de Estrategias de Coping (EEC)* [Coping Strategies Scale], in its original version (Chorot & Sandín, 1987; Sandin & Chorot, 1993, 2003). The scale is based on the model from Lazarus and Folkman (1984) and adapted for university students. A total of 90 items are included where students respond to items on a 4-point likert-type scale ranging from 0 (never use the strategy) to 3 (always use the strategy). This scale possesses acceptable validity and reliability values.

Self-regulated Learning (D2), regulatory teaching (D1), process variables, and Satisfaction with Learning (D3), product variable, which were assessed using the IATLP Scales (De la Fuente & Martínez, 2004, 2008). The revalidated version of this scale (De la Fuente, et al, 2012) assesses these three variables. Overall reliability of this scale is $\alpha=0.75$ (acceptable). These three scales possess acceptable validity and reliability values.

In order to assess academic performance, we made use of the *academic-professional competencies assessment model* (De la Fuente, Justicia, Casanova & Trianes, 2004). Following this competency model, we took the mean scores that teachers assigned to the students at the end of a full-year subject. Total performance, on a scale of 1 to 10, is the final grade given to the student for this subject. The 10 points are a compendium of results obtained on the three levels of subcompetencies, conceptual, procedural and attitudinal: 1) *Conceptual scores*: includes all scores obtained on exams covering the conceptual content of the subject (4 points); 2) *Procedural scores*: assessed from the student's practical work covering procedural content and skills (4 points); 3) *Attitudinal scores*: scores given for class participation and for optional assignments undertaken for a better understanding of the material (2 points). In order to carry out the different analyses and compare the results, the different subcompetency scores were converted to an equivalent scale of 1 to 10.

Procedure

Information from self-reports was collected in the classroom during regular class from both university students and competitive examination candidates. For the university students, data on *Presage* variables (personal self-regulation, sex, age) was collected during the month of October. Later, in the month of February, students completed the scales measuring *Process* variables (learning approaches, coping strategies, self-regulated learning and regulatory teaching). In the month of May-June, satisfaction with learning was assessed, and teachers of the participating classes were asked for the mean total scores for each student, as measured through continuous assessment over the academic year (*Product* variables). Competitive examination candidates, on the other hand, completed the different questionnaires during their preparatory course. Candidates provided data on

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Presage variables (personal self-regulation, sex and age) in October, and, depending on time availability, they completed the questionnaire pertaining to the Process variables (coping strategies) at some time during the course.

Design and Data Analyses

The nature of this investigation, in addressing its objectives and hypotheses, constitutes a non-experimental ex post-facto design. In terms of data collection, it is a survey investigation using self-reports (questionnaires and scales) and a cross-sectional strategy.

Association analysis through Pearson bivariate correlations and linear regression for Association objectives and hypotheses; and cluster analysis, ANOVAS and MANOVAS (with Scheffé post hoc, and effect size estimates) for inferential objectives and hypotheses. Analyses were carried out to meet the proposed objectives and test hypotheses using SPSS version 21.00 for Windows.

4. RESULTS

We found a significant, positive correlation between total self-regulation, goals and perseverance with learning approaches and its components. We also observe a positive correlation with deep approach and negative with surface approach. See table1.

Table 1
Correlations between personal self-regulation and learning approaches

Dimensions & Factors	SHORT SRQ	Personal Goals	Perseverance	Decision Making	Learning from mistakes
Deep approach	.312**	.413**	.278**	.181*	.169*
Surface approach	-.337**	-.319**	-.276**	-.286**	-.238**
Deep motivation	.262**	.364**	.244**	.134	.129
Deep strategy	.304**	.385**	.261**	.194**	.177*
Surface motivation	-.322**	-.310**	-.258**	-.292**	-.211**
Surface strategy	-.322**	-.280**	-.253**	-.238**	-.229**

Note: * $p < .05$; ** $p < .01$

Pearson bivariate correlation analysis showed a negative correlation between personal self-regulation (total, perseverance and decision making) and emotion-focused coping strategies. A positive relationship was also found for personal goals and perseverance with problem-focused strategies. See table 2.

Table 2
Correlations between personal self-regulation and coping strategies

Dimensions	SHORT SRQ	Personal Goals	Perseverance	Decision Making	Learning from mistakes
D1.Emotion Focused	-.181**	-.081	-.142*	-.266**	-.099
D2.Problem focused	.086	.149*	.105	-.110	.123*

Note. * $p < .05$; ** $p < .01$

Total self-regulation had a significant, negative correlation with the majority of the emotion-focused factors of coping strategies. The most notable of these were negative relationships for perseverance and decision making in connection with different factors of emotion-focused strategies. See table 3.

Table 3
Correlations between personal self-regulation and coping strategies (emotion focused)

Factors	SHORT SRQ	Personal Goals	Perseverance	Decision Making	Learning from mistakes
F1. Fantasy distraction	-.171**	-.011	-.147*	-.214**	-.084
F4. Religious support	-.136*	-.106	-.074	-.161**	-.012
F6. Help for taking action	.247*	.222**	.280**	.048	.157**
F7. Reduction of anxiety and avoidance	-.179**	-.070	-.141*	-.187**	-.079
F8. Preparing for the worst	-.178**	-.032	-.149*	-.233**	-.089
F9. Emotional venting and isolation	-.203**	-.066	-.197**	-.098	-.194**
F11. Resigned acceptance	-.136*	.006	-.186**	-.111	-.096

Note. * $p < .05$; ** $p < .01$

Total *self-regulation* had a significant, **positive** correlation with the *self-regulation dimension* and with two of its component. Specially, goal and self-regulated learning were found to be related to their dimension and to the different factors. See table 4.

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Table 4
Correlations between personal self-regulation and self-regulated learning

D2. Self-regulated learning	.349**	.484**	.289**	.141	.261**
F2. Planned learning	.441**	.528**	.387**	.229*	.326**
F7. Thoughtful learning	.289**	.417**	.248*	.091	.207*
F9. Study techniques	.144	.234*	.090	.039	.129

Note.

* $p < .05$; ** $p < .01$

The MANOVA performed between IV *personal self-regulation* (groups of low, medium, high) and the DV *learning approaches (factors)*, showed a significant main effect $F(8,380)=4,024$ (Pillai's trace), $p < .001$, $\eta^2 = .078$.

There were several significant partial effects of *self-regulation*: on *deep motivation*, $F(2, 192)=6,039$ (Pillai's trace), $p < .01$, $\eta^2 = .059$, with a post-hoc effect 3 >1 ($p < .01$) and 3 >2 ($p < .01$); on *deep strategy* $F(2, 192)=6,836$ (Pillai's trace), $p < .001$, $\eta^2 = .066$, with a post-hoc effect 3 >1 ($p < .01$) and 3 >2 ($p < .05$); on *surface motivation*, $F(2, 192)=10,841$ (Pillai's trace), $p < .001$, $\eta^2 = .101$, with a post-hoc effect 1 >2 ($p < .05$) and 1 >3 ($p < .001$); and on *surface strategy* $F(2, 192)=8,830$ (Pillai's trace), $p < .001$, $\eta^2 = .084$, with a post-hoc effect 1 >2 ($p < .05$) and 1 >3 ($p < .01$). See Table 5.

Table 5
MANOVA between the groups of personal self-regulation and the factors of learning approaches

Personal Self-Regulation	Surface Motivation	Surface Strategy	Deep Motivation	Deep Strategy
Level 1. Low (n= 52)	2.30 (.76)	2.80 (.74)	2.87 (.66)	2.53 (.71)
Level 2. Medium (n= 86)	1.97 (.65)	2.43 (.61)	2.92 (.60)	2.73 (.60)
Level 3. High (n= 57)	1.69 (.65)	2.27 (.73)	3.25 (.71)	3.01 (.76)
Total (n= 195)	1.98 (.71)	2.48 (.71)	3.00 (.66)	2.76 (.70)

The MANOVA between IV *personal self-regulation* (groups of low, medium, high) and DV *self-regulated learning* showed a significant main effect $F(6,196)=3,577$ (Pillai's trace), $p < .01$, $\eta^2 = .099$.

The MANOVA between the low, medium, high groups in *personal self-regulation* and *self-regulated learning (factors)* showed a significant partial effect of *self-regulation* on: *planned learning*, $F(2, 99)=10,915$ (Pillai's trace), $p < .001$, $\eta^2 = .181$, with a post-hoc effect 1 <3 ($p < .001$) and 2 <3 ($p < .01$); and *thoughtful learning* $F(2, 99)=5,187$ (Pillai's trace), $p < .01$, $\eta^2 = .097$, with a post-hoc effect 1 <3 ($p < .05$) and 2 <3 ($p < .05$). See Table 6.

Table 6
MANOVA between the groups of personal self-regulation and the factors of self-regulated learning

Personal Self-Regulation	F2. Planned learning	F7. Thoughtful learning	F9. Study techniques
Level 1. Low (n= 29)	3.52(.80)	3.63(.73)	4.07(.67)
Level 2. Medium (n= 43)	3.80(.66)	3.73(.70)	4.10(.64)
Level 3. High (n= 30)	4.33(.58)	4.19(.72)	4.30(.60)
Total (n= 102)	3.88(.74)	3.84(.75)	4.15(.64)

5. DISCUSSION AND CONCLUSIONS

Results show a significant, positive relationship between personal self-regulation and deep approach, emotion-focused coping strategies and self-regulated learning. In complementary fashion, the level of personal self-regulation had a significant main effect on deep approach, and more specifically, on deep strategy. Likewise, a *low level of personal self-regulation* is accompanied by a *high level of emotion-focused strategies*, especially in fantasy distraction, help for taking action, reduction of anxiety, preparing for the worst and emotional venting and isolation, a result that concurs with what has been found in prior studies (De la Fuente & Cardelle-Elawar, 2011). And a *high level of personal self-regulation* has an effect on self-regulated learning, being accompanied by a high level of planned learning and thoughtful learning

Personal self-regulation is a variable to be considered in the university teaching-learning process, having as high a predictive value as self-regulated learning, especially in situations of academic stress, since it modulates different learning behaviors and the perception of teaching.

Limitations and prospects

This investigation has some limitations, which should be avoided in future studies. The first limitation is due to the lack of other research results of a comparable nature, referring to our core study variables like personal self-regulation and coping strategies that have been studied mostly in clinical contexts. For this reason, the results obtained here are still tentative; the nascent treatise of this investigation leads us to be cautious in accepting conclusions with these variables. Another limitation has to do with *sample attrition* in some of the analyses, since not all the students completed all of the questionnaires and all the variables like sex, for this reason there was sample loss in some analyses. Future investigations should insist on the importance of completing this data point.

We must insist on the possible utility of the findings obtained in this research for educational practice, and stress certain general ideas that would serve for continuing this line of research. Training self-regulation and coping behaviors can equip students with the needed skills that are common to both self-regulated learning and to self-regulating addictive behaviors, which affect not only the student's health but also his or her academic performance. Other important intervention is to promote and provide favorable conditions for quality teaching-learning environments that encourage deep learning.

ACKNOWLEDGMENT

R & D Project ref. EDU2011-24805 (2012-2014). MICINN (Spain) and FEDER Fund (UE).

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RELATIONS BETWEEN THE PERSONAL SELF-REGULATION AND LEARNING APPROACH, COPING STRATEGIES, AND SELF-REGULATION LEARNING, IN UNIVERSITY STUDENTS (PROCESS)

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