



# Research approaches to the regulation of academic writing: the state of the question

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## Abstract

Effective composition of academic and/or professional texts is a complex task that requires the use of regulation processes. In recent years these processes have been studied from four research approaches: cognitive, sociocognitive, sociocultural and socially shared. This study analyzes their principal theoretical premises as well as the empirical studies realized from each approach, and reflections are offered on the current state of knowledge in the field of writing regulation. In conclusion, we delimit unresolved issues that should guide future research.

**Keywords:** writing processes, self-regulation, co-regulation, shared regulation, writing research.

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## Enfoques en la investigación de la regulación de escritura académica: Estado de la cuestión

### Resumen

La composición efectiva de textos académicos y/o profesionales es una tarea compleja que requiere el uso de procesos de regulación. En los últimos años, estos procesos han sido estudiados preferentemente desde cuatro enfoques teóricos diferentes: cognitivo, sociocognitivo, sociocultural y socialmente compartido. En este trabajo se analizan las principales premisas teóricas y los estudios empíricos realizados desde cada enfoque y se reflexiona sobre el estado del conocimiento actual en el área de la regulación de la escritura. A modo de conclusión se delimitan aquellos problemas no resueltos que deberían orientar el futuro de la investigación.

**Palabras Clave:** procesos de escritura, autorregulación, co-regulación, regulación compartida, investigación de la escritura.

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## Introduction

Teaching how to write effectively is a current need in both educational (Castelló, 2007) and professional contexts (Quinlan & Alamargot, 2007), and research has dealt with this issue extensively in recent decades. One of the conclusions from this research, expressed repeatedly and under diverse conditions, is that effective text production that meets the communication demands of a situation requires the use of composition strategies and processes that regulate written composition (Castelló, 2009; Graham & Harris, 2000; Zimmerman & Riesemberg, 1997). Research on academic writing strategies and regulation processes in higher education – both in terms of how they are conceptualized and how they are taught – is the topic that concerns us in this article.

In the last thirty years, writing regulation processes in academic contexts have been studied from at least four different theoretical-methodological approaches. These are differentiated by their preferential adherence to assumptions of a cognitive, sociocognitive or sociocultural nature. Additionally, in recent years it is possible to distinguish an emerging perspective, albeit closely linked to the sociocultural approach, that considers regulation to be an *individual process that at the same time is shared socially*. All four perspectives will be considered here. At the theoretical level, these approaches have a different understanding of writing regulation processes, and consequently, they assign different roles to the metacognitive, motivational and contextual factors involved therein. At the methodological level, the data collection and analysis procedures that are emphasized in each case can be placed along a continuum that goes from individual-centered (e.g. cognitive approach) to those that prefer to analyze interaction in collaborative writing situations (e.g. socially shared approach).

The objective of this article is to review these approaches and offer an updated analysis of the state of the question in how writing regulation processes are being studied. To do so, we first analyze the theoretical premises and methodological options defended by each. Second, we review empirical studies from each approach that have made significant contributions regarding regulation processes, also indicating in each case what aspects remain to be investigated. This review is limited particularly to research carried out in the context of higher education. Third, we

will make a comparative synthesis of the theoretical notions and methodological approaches that are prototypes of each perspective. Finally, by way of conclusion, we establish prospects for future lines of research in the area of academic writing regulation, based on the problems that this sphere of research is presently encountering.

### **Writing regulation from the cognitive perspective**

Most authors concur in pointing to the decade of the eighties and the Hayes and Flower formulation (Hayes & Flower, 1980) as the starting point for the study of composition processes from the cognitive point of view, and along with that, the first explanations relating to metacognitive control (regulation) of these processes. Ever since this model was initially formulated by these authors, text composition has been understood as a problem to be solved through complex cognitive activities of *planning*, *translating* and *reviewing*, which the writer must control (regulate) in a recursive, coordinated fashion through a process of *monitoring* (Hayes & Flower, 1980).

Beyond this initial formulation, current cognitive theories postulate that regulation or *control* of writing – as it is more habitually referred to in their studies – is carried out through processes of planning and reviewing, conceived of as two complex, interactive systems of metacognitive control (see Alamargot & Chanquoy, 2001 and Roussey & Piolat, 2005 for a detailed review of the different notions of regulation or control of writing within the cognitive perspective). From these theories, planning is considered to be a top-down system of regulation based on a *goal setting* process (Roussey & Piolat, 2005). Through this process the writer activates or constructs a network of objectives and sub-objectives (*goal network*) that allows him or her to control and coordinate the totality of the textual production, through an outline or mental model (Flower, Schriver, Carey, Haas & Hayes, 1989; Hayes, 1996). Reviewing, for its part, is considered to be a bottom-up regulation system, whereby the author uses processes of problem *detection*, *diagnosis* and *repair* to monitor and control achievement of the established goal network, using different solution strategies (Hayes, Flower, Schriver, Stratman & Carey, 1987).

Under the umbrella of this conceptualization, two large lines of research have been followed to deal with the impact of the two metacognitive control mechanisms – planning and revising – on the quality of the text. Studies devoted to planning focus on analyzing the writing goals that writers set, and how these impact text quality (Carey, Flower, Hayes, Schriver & Haas, 1989; Flower & Hayes, 1980; Flower *et al.*, 1989). In a pioneering study, Flower and Hayes (1980) analyzed the goals used by expert and novice writers (university students) for writing an expository text. The results indicate that the experts devoted twice as much time to analyzing the writing requirement, they set more content-related goals and they also set more rhetorical goals directed toward causing an effect on the reader or toward controlling their image as writers of the text than did the novice writers. The latter dedicated less time to analyzing the requirement and set only content and format-related goals, without taking into account the need to set rhetorical or author image goals.

However, this study does not mention the effects of such goals on text quality, such as are found in the study by Carey *et al.* (1989). Results from the latter included the fact that the best texts were produced by writers who set a greater number of goals when beginning the composition process and, moreover, they did so in a qualitatively different way, including not only content, audience and format aspects but also fundamentally rhetorical aspects such as author image.

In order to further specify the definition of goal quality, Flower *et al.* (1989) distinguished between global (text-level) and local (sentence-level) goals. Through analysis of think-aloud protocols, the authors concluded that expert writers set content goals at the global and local level in a more integrated fashion, allowing them to produce higher quality texts, unlike the novice writers who established content goals only at the local level, thus producing texts with a certain coherence at the paragraph level, but disorganized at the global level. Later research has clarified that setting content goals at both the global and local levels allows writers to generate and recover ideas in a more hierarchical, integrated fashion, helping them to produce texts with greater macro and micro structural coherence (Dansac & Alamargot, 1999).

On the other hand, other authors have looked at the type of goals and their specific role in processes of control and regulation, and they affirm that process goals, as a regulation mechanism, play a different role than content or audience goals (Flower & Hayes, 1981; Hayes & Nash, 1996). For these authors, while content goals have to do with defining what the writer wants to say, and audience goals have to do with defining the desired effect on the reader, process goals “are essentially the instructions people give themselves about how to carry out the process of writing (e.g., ‘Let’s doodle a little bit.’ ‘So... write an introduction.’ ‘I’ll go back to that later.’)” (Flower & Hayes, 1981). More recently along these lines, Torrance and Galbraith (2006) state that writers manage to reduce the processing and information management demands on short and long term memory – with the subsequent improvement in regulation processes – when they decide to first dedicate themselves exclusively to exploring and organizing ideas through setting up notes, outlines and/or rough drafts, without worrying about whether they are writing properly according to rhetorical conditions and formal prose, in other words, before they formally translate their ideas.

The second line of research that has been developed from the cognitive perspective has to do with the impact of metacognitive control mechanisms involved in *reviewing* the text quality (Flower *et al.*, 1989; Hayes *et al.*, 1987; Midgette, Haria & McArthur, 2008). The pioneer studies by Hayes *et al.* (1987) analyzed the problems detected by expert and novice writers (university students) and the solutions they adopted for solving them, in their review of an expository text that contained local problems (e.g. spelling) and global problems (e.g. unfulfilled text goals). Results showed that experts detected 42% of the global problems as compared to 15% detected by the novices, such that solving these global problems enabled experts to product higher quality texts (Hayes *et al.*, 1987). According to the authors, these results indicate that the experts showed greater capacity for carrying out and strategically utilizing three types of differentiated *diagnosis* of local and global problems in terms of *intentions*, *rules* and *principles*, and five types of problem solutions, namely: *ignore* the problem (*ignore*), *postpone* the effort of solving the problem (*delay*), *search* for more information to solve the problem (*search*), *rewrite* the text by drafting or paraphrasing (*rewrite*) and intentionally *revise* the text to correct problems according to information supplied by the diagnosis (*revise*).

Recent research indicates that these processes of detection and problem solving often used by expert writers may be owing to a greater mastery of different “*control modes*” such as the control of automatism, rules, and knowledge (Roussey & Piolat, 2005). Along these lines, recent intervention studies confirm the importance of greater mastery of these control modes. Students who had received training in detecting text problems based on content goals (for example, adding information) or audience goals (for example, modifying content in order to persuade) were able to produce higher quality argumentative essays, unlike students who had only received general assistance or did not receive any assistance (Midgette, Haria & McArthur, 2008).

As a whole, studies from the cognitive perspective about setting goals or detecting/solving problems during planning and reviewing processes have been key to a better understanding of the impact of metacognitive control processes on text quality. Moreover, in recent years, in an attempt to overcome limitations regarding a lack of contextualized results from this perspective, some studies have taken a functional, dynamic approach to written composition processes (Rijlaarsdam & van den Bergh, 2006). Results from these and other studies (e.g. van den Bergh & Rijlaarsdam, 2007) reveal the possible multifunctionality of metacognitive control activities according to their activation at different moments of the composition process, and also analyze their differential impact on final text quality (Olive & Piolat, 2003; Roussey & Piolat, 2005).

In the sense of emphasizing the dynamic, recursive nature of composition processes, Galbraith and Torrance (2004) also established that reviewing activities have at least two different functions depending on the type of planning that the writers used. Thus, when writers initially used an outlining procedure, they used reviewing to detect and solve various problems so as to meet the rhetorical objectives present in their outline; by contrast, when an interactive, exploratory method was used to generate content through preparing partial drafts of text, writers used reviewing to identify and select possible ideas and objectives to guide the creation of additional drafts. Since most writers use both procedures for planning content, the authors concluded that what matters is understanding the functions of the different types of reviewing and planning, and how the two relate to other activities in the writing process.

Despite the importance of these contributions, we still know little about the role of both topic knowledge and genre knowledge in processes of metacognitive regulation of writing (see McCutchen, 2000 and Torrance & Galbraith, 2006 for a review of the role played by both types of knowledge in composition processes). Elsewhere, several recent authors who are positioned near the sociocognitive approach (Zimmerman & Riesemberg, 1997; Zito, Adkins, Gavins, Harris & Graham, 2007) have indicated a need to explain not only metacognitive control processes in themselves, but also to explain and study regulation processes in relation to motivational, behavioral and contextual aspects. These aspects are present to a greater or lesser extent in every written composition activity and must be studied in order to fully understand the impact of regulation on writing performance. We turn to these topics in the following section.

### **Writing regulation from the sociocognitive perspective**

In the decade of the nineties, Zimmerman and Riesemberg (1997) disseminated a new conception of writing which we know by the term *sociocognitive*, according to which “*Writing is more than a literary expression of cognitive skill: It is a social cognitive process wherein writers ... use a variety of behavioral as well as cognitive methods to garner and sustain affective experiences and motivation*” (Zimmerman & Riesemberg, 1997).

With regard to writing, these authors postulated that self-regulation can be understood as the “*self-initiated thoughts, feelings and actions that writers use to attain various literary goals, including improving their writing skills as well as enhancing the quality of the text they create*” (Zimmerman & Riesemberg, 1997).

Under these premises, the initial theory by Zimmerman and Riesemberg (1997) proposes that writing regulation is carried out through a “*triadic system of self-regulatory processes*” comprising environmental, behavioral and personal self-regulatory processes. However, the authors have recently reconceptualized this initial formulation of self-regulation of writing as a triadic system (Zimmerman & Kitsantas, 2007), and propose a cyclical model of self-regulatory writing composed of three phases of writing regulation: the forethought phase, the performance phase and the self-reflection phase. The elements that comprise each of the three phases of the

model are based on research in self-regulation from diverse academic, athletic and professional spheres (see Zimmerman, 1998 and Zimmerman & Kitsantas, 2007 for a detailed review of this research).

From the methodological point of view, most studies developed from the sociocognitive perspective take the form of experimental or quasi-experimental intervention designs, for the most part with student populations from secondary education and to a lesser extent from university.

Two main lines of research oriented to the teaching and learning of writing strategies can be distinguished: the first is headed by intervention studies from Zimmerman and collaborators, where their model of regulatory skill acquisition is put to the test (Zimmerman, 2000) and the second is represented by Graham and Harris (2009), who also deal with the development and acquisition of self-regulatory strategies through their proposal called *Self-Regulated Strategy Development* (SRSD).

The first of these two lines of research (Zimmerman, 2000) proposes that the best way for students to learn new writing skills is through a teaching-learning process of four sequential levels: observation, emulation, self-control and self-regulation. In the observation level, through modeling, the student acquires a clear picture of how writing regulation strategies should be executed. At this level the student learns by observing actions and listening to descriptions of models, and motivation comes through the recognition that the modeler offers to the learner. For example, the use of mind mapping as a technique for hierarchical and sequential organization of the content of an expository text can be modeled; at this level the student is limited to observing and listening to explanations about the use of this technique.

At the emulation level, students learn to regulate their writing by emulating the execution of the model. A student is considered to have reached this level when he or she can execute the modeled skill on their own, and when the learner's source of motivation is based on improving their performance thanks to behavioral and social feedback processes. Continuing with the

example, at this level the student would practice the technique of mind mapping according to the criteria and standards indicated under the teacher's direction.

At the self-control level, the student works on improving and automating the learned writing skill or technique through self-initiated and self-directed practice. At this level the learner compares his or her level of performance with the standards for regulating a given learned skill or technique learned previously from the model, and their motivation is based on self-satisfaction arising from the fulfillment or surpassing of these standards. For example, the student can compare the mind map that he or she has prepared for a new topic with mapping models.

Finally, at the self-regulation level, the student learns to adapt learned skills and techniques to writing tasks with different conditions. At this level, the students' main challenge is to transfer what he or she learned through modeled processes to diverse situations where the results from using a determined technique must be anticipated. For example, supposing that the student had learned not only the mind mapping technique, but also the technique of comparing and contrasting as a tool for organizing the ideas of a text, the challenge for the student could be to decide which technique to use in order to organize the content of a new text in question.

In summary, Zimmerman (2000) proposes that these four sequential levels allow for progressive development of regulation skill, where the student passes from being controlled and motivated socially to being self-controlled and self-motivated. The central premise of this model is that *"the observation and emulation levels (1 and 2) represent social learning experiences that prepare learners to achieve competence at the self-control and self-regulation levels (3 and 4)"* (Zimmerman & Kitsantas, 2002).

In recent years, the authors have carried out several intervention studies to study the impact that these four levels of instruction have on the acquisition of different writing skills and on different motivational factors such as the perception of self-efficacy as a writer (Zimmerman & Kitsantas, 1999; 2002). Generally speaking, their results indicate the effectiveness of the intervention model, since they confirm the idea of sequential, multilevel development in the acquisition of writing regulation skills and their impact on different motivational factors.

However, as these authors acknowledge, these results were obtained in highly formalized, structured writing tasks, clearly making them different (probably less complex) than academic writing tasks in contexts of higher education. The latter are often open-ended, with many possible realizations, and are more complex to revise.

The second line of research in this perspective was initiated in the nineties, when Harris and Graham (1992) revealed their Self-Regulated Strategy Development model (SRSD). In the SRSD model, writing (and its development) is understood as a complex process based on four factors: strategies, transcription skills, knowledge and motivation (Graham & Harris, 2009).

Strategies are understood as self-regulation skills such as goal setting, self-monitoring, self-instructions, self-assessment and self-reinforcement, allowing the writer to actively direct and control the composition process. These are referred to as high-level skills and involve a high cognitive demand. Transcription skills are low-level skills (low cognitive demand), referring primarily to handwriting and spelling, allowing the writer to transform the words he or she wants to say into written symbols on a page. Knowledge refers to different types of knowledge involved in writing, such as knowledge of the topic, of the audience, of the genre, language knowledge, etc. Finally, motivation takes into account several motivational constructs such as self-efficacy, positive and negative attitudes toward writing, and so on.

The SRSD model assumes a sociocognitive conception of writing regulation, understood as *“the process by which students activate and sustain cognitions, behaviors, and affects systematically oriented toward the attainment of goals”* (Zito *et al.*, 2007). The SRSD model is a direct method of teaching writing regulation strategies, based on 6 instructional stages: *1) developing and activating background knowledge, 2) discussing the strategy, 3) modeling, 4) memorization, 5) support and guidance in using the strategy 6) independent performance* (see Graham & Harris, 2009 for a detailed explanation of each stage).

In the last 30 years, Graham, Harris and collaborators have used experimental and quasi-experimental designs to research the impact of the SRSD intervention model on writing

regulation strategies, on transcription skills, on writing-related knowledge and on various motivational factors (De la Paz & Graham, 2002; Graham, Harris & Mason, 2005; see Graham, 2006 for an exhaustive review of studies that have analyzed the impact of the SRSD model on learning writing). Generally speaking, the results reveal the effectiveness of the SRSD model for improving performance in expository writing, especially of students in early stages of development, and also in students with learning disabilities in writing.

Students with learning disabilities in primary and secondary education have been a research priority for these authors, particularly in the analysis of teaching writing strategies and regulation skills to them (Graham, 2006; Graham, Harris & Mason, 2005). Their results with this group of students show the model's strength in at least five aspects of writing performance in these students: a) improvement in learning and using writing regulation strategies both in planning and reviewing different types of texts, b) learning basic writing knowledge, c) writing quality, d) attitude toward writing, e) self-efficacy. However, they also reveal the difficulty of measuring perceptions of self-efficacy with primary students and the need to clarify the role of peer assistance in the effectiveness of teaching strategies and knowledge through the SRSD model.

In summary, the sociocognitive models by Zimmerman (2000) and Graham and Harris (2009) offer a theoretical explanation of writing regulation that, unlike cognitive models, emphasizes the importance of several cognitive, behavioral, affective-motivational and environmental factors that intervene in any writing activity and should be regulated in order to achieve specific writing goals. In a broad sense, sociocognitive studies show evidence for the effectiveness of both instructional models in improving students' writing performance on a variety of text types. Nonetheless, according to recent research on motivation in writing (see, for example, Hidi & Boscolo, 2007 for the state of the question), there are other factors not included in these models, such as interest in the topic and the task, that also appear to influence the regulation of writing (Boscolo, Favero & Borghetto, 2007). Thus, little is known about the impact of these models on the learning and use of *strategies for regulating motivation* during the writing process, as something different from the usual *strategies for regulating the cognitive process* of writing (Wolters, 2003, p. 192). On the other hand, as we already mentioned, almost

all instructional effects obtained from both models have been positive in primary and secondary education, but it is difficult to extrapolate their results to university contexts with quite complex expository and/or argumentative writing tasks (Andriessen & Coirier, 1999).

Unlike the sociocognitive perspective that studies writers' individual processes for regulating writing at the cognitive, motivational, behavioral and contextual levels, and the impact of these regulation processes on text quality, the sociocultural perspective focuses mainly on explaining and studying co-regulation processes in writing. In the next section, we present the premises and empirical studies carried out in this regard.

### **Writing regulation from the sociocultural perspective**

From the sociocultural view, text composition is considered to be a discursive, dialogic and situated practice, developed by members of a community within a determined social, cultural and historical context (Castelló, 2007; Prior, 2006). Novice community members learn to write and to regulate composition through their participation in genuine discursive practices and through social interaction with more expert or advanced members (Englert, Mariage & Dunsmore, 2006).

If we think about school contexts, teachers (and some students), in their role as advanced members, offer various types of guided, adapted scaffolding or assistance in terms of knowledge, procedures, and other cultural tools. The ultimate purpose is for the student in his or her role of learner to appropriate these and use them autonomously and independently (Englert *et al.*, 2006). Along these lines, teachers and students are immersed together in the activity of writing; they are involved in furthering a discursive interaction that allows them to construct knowledge and share situated meanings about plans, goals, processes and important decisions within a common regulation space. Through these complex mechanisms of scaffolding and intersubjectivity, teachers exercise powerful social mediation that allows the transferral or gradual transition of teacher-directed regulation to writing regulated by the student himself (student-directed regulation) (Hadwin, Oshige, Gress & Winne, 2010). Thus, in accordance with Vygotsky's notion of the "zone of proximal development" (ZPD), teachers help the student, through processes of

transfer and release of control, to appropriate knowledge that allows them to self-regulate and handle complex writing tasks on their own, for which they previously needed external regulation and help. The mechanism that allows the transfer of control from external regulation to self-regulation is conceptualized from this perspective as a co-regulation activity (McCaslin & Hickey, 2001).

Furthermore, the activity of co-regulation extends beyond face-to-face interaction processes and mediates students' individual writing regulation activity without the physical presence of another person from the community (McCaslin & Hickey, 2001; Pressley, 1995). Thus, the activity of writing regulation, even when it is carried out alone, on an intrapsychological plane, is always mediated by the writer's dialogue with other voices in an interpsychological space or plane, and by internalized cultural tools and aids that allow the writer to make more or less strategic decisions (Castelló, 2007; Flower, 1994; Monereo, 2007; Pressley, 1995). In this dialogue, which takes place between the inter- and intra-psychological planes, the writer constructs a context of the communicative situation, where, between the writer's own voice and other voices, he or she negotiates meanings that pertain to the purpose, content and form of a given text (Flower, 1994; Prior, 2001). From the sociocultural perspective, it is assumed that individual writing regulation processes at the cognitive-affective level are always situated in and mediated by the social, cultural and historical context wherein they are taking place, and are linked to the identity adopted by the writer (Castelló, 2007; Prior, 2006).

Based on these premises, several studies on co-regulation processes in writing have been carried out. One first group of studies is devoted to analyzing the processes of *co-regulation among university students* in collaborative text planning situations (Burnett, 1994; Higgins, Flower & Petraglia, 1992). For example, Higgins and collaborators (1992) inquired into the role of peer assistance or scaffolding in text planning. Their study involved 22 undergraduate students grouped into pairs, where one student had the role of tutor and the other of writer. The pairs had to plan their texts using four types of prompts: 1) purpose or main points of the text, 2) audience, 3) text conventions and 4) content of the topic.

The results identified two patterns of collaborative planning: a list-based pattern and an interactive pattern. In the former, students in the tutor role used the prompts (purpose, audience, etc.) as lists of questions to ask the student in the writer role, helping them to verbalize their plans, but not encouraging their reflection about these or about the rhetorical purpose. By contrast, in the interactive pattern, the student in the tutor role used questions or inquiries that required his or her partner to make goals and purposes explicit, to think of alternative solutions in the case of difficulty, and to justify the choice of such plans. Unfortunately, the study does not provide data regarding how these patterns influenced final text quality, nor does it specify the questions or different *verbal movements* of the two patterns.

In a later analysis of the same data, Burnett (1994) pointed out that the pairs that used interactive patterns characteristically used scaffolding processes based on four types of *verbal movements*: giving prompts, giving content information, challenging and directing the writer. Burnett's observations (1994) indicate that successful, *committed collaborators* were characterized by diversified, frequent use of the four verbal movements, and particularly by their strategic use of each, depending on the need and the moment of the planning process. By contrast, inexpert collaborators adopted an authoritarian role, criticizing their classmate's plans, offering most of the important ideas, or making the classmate's text their own, confusing their role as collaborator.

Burnett (1994) indicates that in addition to these verbal movements, other affective factors may have influenced how the committed collaborators proceeded, such as greater awareness of the social context of the task, a positive self-image as writers and greater motivation, responsibility and receptivity toward the collaborative planning activity. Despite the empirical importance of these results for understanding scaffolding and co-regulation processes in writing, few studies have continued to analyze verbal movements and affective factors that give rise to *interactive patterns* or other types of collaborative planning situations in the university context.

A second group of studies analyzes *co-regulation processes between university students* in reviewing situations (Castelló, Iñesta & Monereo, 2009; Castelló, González & Iñesta, 2010;

Cho, Schunn, & Charney, 2006). Castelló and collaborators (2010) analyzed the problems that postgraduate students perceived, and the changes that they made in order to fix them, in collaborative, pair-work revision of three successive versions of a chapter of their thesis project, after they attended an academic writing workshop.

Results show that some pairs, over the course of the three review sessions, focused primarily on solving coherency problems at the sentence and paragraph level, on improving the clarity of ideas at the syntactic and structural level, and on solving problems of inappropriate terminology through the use of modals and by including additional information. Other pairs did not define the problems specifically, thus hindering their resolution and the subsequent improvement of the text. Again, this study did not indicate the impact of the two patterns on the quality of the texts produced by the pairs, nor does it analyze students' discourse during the collaborative revision sessions.

In this respect, Cho and collaborators (2006) studied the types of comments that university students (undergraduate and graduate) and teachers make about other students' texts, and they analyzed the usefulness of these comments as perceived by the authors of the texts. Both reviewers evaluated the texts according to 3 dimensions: fluency of prose, argumentation and insight. One notable result was the fact that the teachers, in their role as experts, made greater use of directive comments regarding the dimension of fluency of prose and of argumentation. The undergraduate students, in their reviews, used both directive comments and praise in the three dimensions evaluated, while the postgraduates combined the expert and the undergraduate patterns. Although the students did not differentiate between the comments offered by experts and those offered by peers, they did differentiate between directive comments and praise.

A third group of students focused on studying the role of "procedural aids" that teachers offer their students to help them with planning and reviewing their texts (Allal, 2008; Wallace, 1994). In a recent study, Allal (2008) analyzed the impact of whole-class discussions on students' revisions. The sample was made up of three different classrooms, and even though the three teachers had the same didactic sequence, Allal found differences in how they helped students to

elaborate the content, to construct a guide for drafting an autobiography and to revise the texts. Thus, when the teachers facilitated discussion and participation in the construction of categories for the guide, and when they offered multiple examples of thinking (modeling) and interpreting the review process, students made a greater proportion of revisions at the organizational and semantic levels of the text, and produced better texts.

While most of the sociocultural studies reviewed above focused on studying co-regulation processes between teachers and students or between students, recently a new group of studies is emerging that focuses on exploring individual regulation processes carried out by expert writers in authentic tasks – while recognizing their situated, dialogic and socially mediated nature (Iñesta, 2009; Iñesta & Castelló, in press). We may classify these studies as the fourth and final group within this perspective. Along these lines, Iñesta (2009) compared the regulation processes of two expert writers during composition of a scientific article in two languages. In this case the units of analysis were the *regulation episodes*, considered to be the action sequences strategically implemented by the authors in order to solve a difficulty identified in the composition process (Iñesta & Castelló, in press).

Results indicate that it is possible to differentiate between explicit and implicit regulation episodes. In the former, writers intentionally regulate their performance when consciously facing challenges or problems in writing. In the latter, the writer is not able to identify or formulate any specific problem, despite the fact that his or her performance reveals intense regulation activity, evidenced by records of writing activity, including many varied actions involving deletions, reiterated modifications of words and phrases, several attempts at composing a sentence or a paragraph, etc. Moreover, on some occasions regulation episodes are resolved during a single working session (intra-session), while in other cases, although less frequently, the episodes are readdressed in several sessions. This might indicate that for some aspects of writing, ongoing, *open* regulation processes are required, spanning the entire composition process.

Finally, some data from this study also show that explicit and implicit regulation processes used autonomously by expert writers in authentic writing tasks, despite being produced in apparently individual writing situations, are always co-regulated, that is, they are socially

mediated and scaffolded by the quality norms and criteria of the research communities which the authors are addressing.

In summary, sociocultural studies on writing co-regulation processes have generated important contributions to the teaching of writing regulation in the last two decades (see, for example, Englert *et al.*, 2006 for a review of several proposals with a sociocultural orientation for teaching writing). These focus fundamentally on an understanding of the complex processes of scaffolding and intersubjectivity which writers and collaborators are involved in when performing authentic writing activities within discursive communities that are socially, culturally and historically situated (Burnett, 1994; Castelló, *et al.*, 2010; Chon, *et al.*, 2006; Iñesta, 2009). However, we still know relatively little, not only about the usefulness of scaffolding types that seek to facilitate the acquisition of writing regulation procedures, but also about how teachers and students use them, including how certain external aids (for example, computer programs) can facilitate acquisition of declarative, procedural and metacognitive knowledge in a specific writing situation (Azevedo & Hadwin, 2005). In recent years particularly, certain studies on socially shared regulation processes (Hadwin, *et al.*, 2010) take the *interaction between individual and collective regulation in collaborative learning situations* as their unit of analysis, and these may be an interesting contribution to help overcome some of the limitations of studies carried out to date. The following section presents the premises of this perspective and its related studies.

### **Writing regulation from the socially shared perspective**

As we affirmed at the beginning of this article, in recent years it is possible to identify an emerging perspective in the study of regulation, which, while sharing the basic assumptions of sociocultural perspectives, understands regulation as the set of activities whereby individuals regulate both their own individual activity as well as the collective activity in which they are participating (Hadwin, *et al.*, 2010). From this perspective, referred to as situated, socially shared regulation, these activities allow the co-construction of a mutual understanding of the tasks, with shared activities for goal setting and planning, execution and evaluation that students carry out *as a group* in order to jointly resolve a task (Hadwin, *et al.*, 2010). In this sense, it can

be stated that socially shared regulation is a *collective or common regulation* where regulation processes and products are distributed among the group, and at the same time are the responsibility of each one of the individual subjects that make up this group (Jackson, McKenzie, & Hobfoll, 2000).

Research carried out from this perspective seeks to analyze both the shared regulation processes executed by a group and the individual regulation processes that the members of the group make use of to regulate other members or the entire group. As in the sociocultural studies, discourse analysis and analysis of trace data are the principal sources for analyzing regulation processes (see Hadwin, *et al*, 2010 for a methodological comparison).

These shared regulation processes have been investigated primarily in problem solving, either within *Computer Supported Collaborative Learning* situations (CSCL) (Vauras, Iiskala, Kajamies, Kinnunen & Lehtinen, 2003), or in face-to-face learning situations (Volet, Summers & Thurman, 2009), but there are practically no studies that focus exclusively on writing. Toward this end, it may be useful to establish channels of theoretical and methodological dialogue between these studies and those that deal with analysis of collaborative writing regulation whether in face-to-face contexts (Lowry, Curtis & Lowry, 2004) or with computer support (Erkens, Jaspers, Prangma & Kanselaar, 2005). In particular, some of the new platforms designed to favor computer-supported collaborative writing (Clark, Sampson, Weinberger & Erkens, 2007) may make it possible to analyze shared regulation processes carried out by students when they write collaboratively, examining the division of roles, use of tools, the sharing of emotions and knowledge and the patterns of discursive interaction that they make use of in order to plan, write and review a text within a socially shared virtual space. Undoubtedly, in the immediate future, the link between the two fields can be an important area where research can explore the complex relationships between individual and shared regulation in the group production of authentic texts.

## **Synthesis and conclusion**

Processes of regulating written composition have been studied in recent decades from at least four large theoretical-methodological approaches: cognitive, sociocognitive, sociocultural and shared social (See Table 1 for a comparative synthesis). The cognitive perspective has primarily dealt with the study of metacognitive control processes as they pertain to either the planning process – particularly to goal-setting – or the reviewing process, specifically with activities that detect and resolve text problems. Designs used from this perspective tend to differentiate the action of expert writers from that of novices, and they approach writing as fundamentally an individual activity. The texts usually address specific, closed requirements and are developed during brief, predetermined time periods. From the methodological point of view, they tend to use analysis of think-aloud protocols, and correlational, experimental designs.

Research from the sociocognitive perspective, on the other hand, has been devoted fundamentally to discerning the impact of teaching different self-regulation procedures, due in part to its orientation toward analyzing the contexts of actual practice. These procedures are organized in models that involve both cognitive and affective-attitudinal regulation strategies. The research designs used from this perspective are fundamentally quasi-experimental, and involve the analysis of specific interventions on the writing performance of students in different contexts. Although the interventions have occasionally been applied in natural contexts, it is customary for such interventions to be implemented in controlled fashion, according to the methodological demands of controlling variables.

Elsewhere, studies carried out from sociocultural perspectives have preferred to work from natural educational contexts, with the objective of studying how aids and scaffolding from both teachers and more advanced peers are internalized, in other words, how the appropriation of regulatory activity for written composition is facilitated, through the study of co-regulation processes. Methodologically speaking, the most frequent design is that of case studies, both individual and multiple, with the data for analysis coming from the discourse in interactive situations, normally recorded through techniques of video-recording, audio-recording and/or

computer screen captures, and complemented with supplementary information from diaries, self-reports and documents.

Finally, the shared regulation studies, despite their theoretical affinity with sociocultural studies, are distinguished methodologically by their interest in the study of processes by which *multiple persons regulate a collaborative discursive activity*. In this sense, they analyze joint regulation processes that students carry out *as a group* in order to solve collaborative writing tasks, normally with computer support. For this end, case studies are generally the methodological design, where data is collected from group activities through computer trace data, in addition to other procedures mentioned in the sociocultural perspective. These studies also share the same analysis systems of the sociocultural perspective, although they seek to reduce the information such that it is possible to establish relationships and patterns in both individual regulation activity and group activity, as well as relationships between the two.

In conclusion, we wish to make note of two current challenges that relate to research on the processes of regulating written composition, which we feel are forthcoming from the review given here. The first is a theoretical challenge, and has to do with the importance of making an effort to integrate the concepts and premises established by the different perspectives, taking into account current debates and recent theoretical-conceptual advances in certain variables that have been identified as key to the study of regulation, particularly in the realm of studies on motivation in writing (Hidi & Boscolo, 2007). Second, it would be beneficial at the empirical level to move toward the use of more molar regulation measurements that also include the time dimension (Castelló, 2007; van der Bergh & Rijlaarsdam, 2007). This is implied, for example, by the regulation episodes proposed by Iñesta (2009), making it possible to study regulation processes in a more multifunctional, dynamic and integrated fashion, preferably in authentic writing tasks. In order to face this challenge, future research will undoubtedly find it essential to make combined use of online and offline instruments for assessment of regulation processes involved in written composition (see Fidalgo & Nicasio, 2009 for a broader review). Addressing both challenges will help us advance in both theoretical development and in research design, as well as strengthen certain educational practices in the area of academic writing.

Table 1. *A comparative synthesis of research approaches that investigate writing regulation processes*

	<b>Cognitive</b>	<b>Sociocognitive</b>	<b>Sociocultural</b>	<b>Socially shared</b>
<b>Notion of writing</b>	Cognitive processes of planning, translating and revision.	Complex cognitive, motivational and behavioral activity in interaction with the social and physical environment	The writer's discursive activity, which is mediated, dialogic and situated within a discursive community and located within a determined social, historical and cultural context	A discursive activity <i>shared among</i> members of a discursive community and located within a certain social, historical and cultural context
<b>Notion of regulation</b>	Metacognitive systems used by the writer in order to control text production: <ul style="list-style-type: none"> <li>• Planning: goal setting</li> <li>• Revision: problem detection, diagnosis and solution</li> </ul>	Self-initiated thoughts, feelings and actions that writers use to achieve certain writing goals, such as improving their writing skills or improving the quality of the text they have created	Process of transfer from external (expert) regulation to internal (learner) self-regulation of the knowledge that makes it possible to regulate a certain discursive activity.  Socially co-regulated self-regulation process, based on the internalization and situated use of different aids and cultural tools during realization of a certain discursive activity.	Processes by which multiple persons regulate a collaborative discursive activity  Processes for co-construction of a mutual understanding of the task, shared goal setting and shared planning, execution and evaluation activities that students carry out <i>as a group</i> in order to jointly solve a collaborative writing task
<b>Unit of analysis</b>	Metacognitive processes of planning and revision	Self-regulation process of cognitive activities, and motivational, behavioral and environmental factors involved in text production	Face-to-face co-regulation processes between pairs in planning or in reciprocal revision of an individual text  Co-regulation processes between teacher and students at the whole-class level or with tutors  Individual self-regulation processes, socially co-regulated through diverse mediators (e.g. dialogue with other voices, text production conditions, etc.)	Shared regulation processes performed by a group, and individual regulation processes used by members of the group in order to regulate other members or the whole group during an authentic collaborative writing task  Examines the contributions, roles, evolution of ideas and the way that <i>groups collectively</i> set goals, monitor, evaluate and regulate their socially shared space during an authentic collaborative writing task
<b>Collection methods</b>	Protocols	Protocols ; Self-reports Interviews: Questionnaires	Interviews : Diaries Dialogues; Video-audio-screen recordings (e.g. Camtasia) Documents (e.g. drafts)	Computerized recordings of shared and individual activity Self-reports
<b>Analysis methods</b>	Experimental Correlations	Quasi-experimental studies	Case studies Classroom investigations Intervention studies Discourse analysis Content analysis	Case studies Trace data analysis Discourse analysis Content analysis

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