CHAPTER 4.

SITUATED REGULATION WRITING PROCESSES IN RESEARCH WRITING: LESSONS FROM RESEARCH AND TEACHING

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> We need to see when, how, and to what purpose [scientific writing] is employed in the concrete settings of human history.
>
> *- Charles* Bazerman *(1988, p. 313)*

My research on writing regulation is rooted in the disciplinary background of educational psychology, and specifically in the sociocognitive and sociocultural approaches to the field. More than fifteen years ago, when I started to focus on graduate and researcher writing, Charles Bazerman's pioneering historical and social account of scientific writing was an invaluable touchstone for my own disciplinary understanding of scientific language as a psychological, social, and linguistic tool, and of its effects on individuals and groups (Bazerman, 1988). The quote that introduces this chapter was a watchword, one that guided me in the reinterpretation and further elaboration of my conceptual framework, anchored in European interpretations of the works of Bakhtin and Vygotsky (Allal, 2020; Camps & Fontich, 2020). As a psychologist, I was (and am) above all interested in when, how, and why particular writers employ scientific language in the specific contexts of their research. Studies of how writers deal with research genres in real communicative situations and natural contexts were not predominant fifteen years ago in Europe, and this dialogue with voices from other contexts was crucial in my future work development.

This chapter chronicles the results of my own inner dialogue with Bazerman's contributions on scientific writing and regulation, a process that allowed me to expand the scope of my research on these topics and confront them from a different disciplinary background. As Bazerman himself wrote, "communication across [these] disciplines occurs only with tolerance and charity in respecting each other's conceptual domains" (Bazerman, 2012, p. 266). I trust readers to

apply these attitudes to make such cross-disciplinary communication possible. In the first section, I characterize research writing as a socio-historical activity, crucial to researcher development, and I analyze the particular challenges early-career researchers face when dealing with—and learning to write in—specific research genres. I also examine the role of writing regulation processes in this characterization, while distinguishing between and problematizing the notions of self-regulation, co-regulation, and socially shared regulation, as well as their respective theoretical roots. In the second section, I consider some of the lights and shadows from our recent research on graduate and postgraduate students' cognitive, social, and emotional regulation writing processes, dealing with research genres such as theses, dissertations, and research articles. The focus is not only on results and knowledge contribution, but also on the methodological issues that underlie the study of regulation from a situated perspective. The potential of adopting a comprehensive unit of analysis—e.g., the regulation episode—is explored in contrast with a range of other traditional and innovative measures. Finally, the last section is devoted to a reflection on the role teaching plays in increasing our understanding of how research writing regulation works, and how it helps students make purposeful decisions as to how, when, and why to use certain resources and writing discursive mechanisms.

RESEARCH WRITING AS A DIALOGIC, HYBRID, AND SOCIO-HISTORICAL EPISTEMIC ACTIVITY

Research writing has been characterized as a particular kind of dialogic persuasive endeavor (Hyland, 2002; Tardy, 2012), one that involves not only the author(s) and the reader, but also the authors' and others' voices that are invoked in the minds of the author(s) (Bakhtin, 1986; Hermans, 2001). These additional voices may or may not be apparent in the final text (Bazerman, 1988; Prior, 2001). Thus, research writing is a highly rhetorical activity that involves the broader presence of the disciplinary research community (Bazerman, 2012) as well as the authors' identities and voices, all engaged in an asynchronous conversation (Castelló & Iñesta, 2012; Castelló, in press; Castelló & Sala-Bubaré, in press).

This particular conversation requires a combination of other literacy-related abilities, such as reading at different levels and with different purposes, talking about writing and texts, and discussing when, how, and why to communicate authorial voice and intentions. Though the relative importance of each of these abilities varies, it is impossible to think about research writing without accompanying it with intense and concurrent reading and with discussion of content and processes.

I have also argued that the hybrid nature of research writing implies producing different types of texts, usually invisible to students but necessary to manage complex research genres such as articles, theses, or research reports. These texts are *transitional* since they help writers to transition, to make the move, for instance, from ideas to assertions, from data to graphics, or from protocols to explanations. They are not mere drafts, since they have a different textual formulation than the final text, and because of that, they require writers to transition among diverse formats, modes, and formulations. The process of transforming raw data into graphics or tables and writing appropriate explanatory text in research articles is a clear example of the importance of such transitional texts (Castelló et al., 2007; Castelló, in press).

From a socio-historical perspective, research writing can be understood both as a psychological *tool* and as an *activity* in and of itself (Castelló & Sala-Bubaré, in press). It is well documented that writing is a psychological tool that, in the words of Vygotsky, allows us to manage, alter, and improve our high-order thinking (Bazerman, 2012; Vygotsky, 1980). Writers learn about their research topic, the genre and themselves as they write (Bazerman, 2009). Thus, research writing is an epistemic tool for knowledge construction and transformation, both for individual writers and for the disciplinary field as a whole (Castelló & Iñesta, 2012). This epistemic power connects with one of the primary purposes of research writing, to advance our reasoning and understanding of a given topic as individuals and societies.

At the same time, texts are also tools for cultural communication, transmission, and evolution (Bazerman, 2008; 2009; Bazerman & Bonini, 2009), since they embody ways of knowing and being in situated (social, cultural, and historical) writing contexts (Barton et al., 2000; Castelló et al., 2013; Bazerman, 2012). Researchers inevitably participate in a wide range of communicative situations, mediated by myriad research genres, which in turn are built and constrained by discipline-specific and historically evolving practices, values, and knowledge. In the framework of these practices, the presence of research genres varies from one discipline to the next, with new genres often emerging in most of them.

Research genres have multiplied and diversified dramatically over the past few years, as research purposes have gradually shifted to meet new social challenges. Researchers have been compelled to reinterpret their work and the overall paradigm of scientific contribution, and to gradually move from producing *science for society* to doing *science with society*, the latter practice involving the forging of new understandings and complicities with different stakeholders and societal agents (European Commission, 2018; Plieninger et al., 2021). While traditional genres such as research articles, dissertations, and theses are still

pervasive and valued in most disciplines, new genres are emerging to address changes in research purposes and practices. For example, researchers are finding ways to face the need for greater and broader dissemination (e.g., through outlets such as Twitter, TED-talks, etc.), to increase multimodal communication (e.g., digital grant applications or continuous online reporting) and to respond to the pressures of globalization (e.g., research blogs, self-pre-publishing, social researchers' platforms). We do not know yet how, and to what degree, these new genres are making an impact and displacing traditional genres.

Nonetheless, research articles and master's or Ph.D. theses and dissertations often remain the main—or indeed the only possible—gateway into research communities in most disciplines. Consequently, most of our research has focused on how (early career) researchers write (or learn to write) in those common genres. Moreover, our studies have often been predominantly limited to research writing in social sciences, especially the fields of psychology, nursing, education, ecology, and sport sciences. The evidence I discuss in the following sections comes from those disciplines, I am aware that "each discipline and specialty have specific forms of argument that are sensitive to the changing social and conceptual structure of the field, as well as to the way in which evidence is linked to the conceptual terms and calculated upon" (Bazerman, 2012, p. 265). Consequently, any attempt to apply these results elsewhere or to use them to interpret writing in other disciplinary contexts should be undertaken with caution.

LEARNING TO WRITE RESEARCH GENRES— ARTICLES AND THESES—IN SOCIAL SCIENCES

Writing articles and theses during master's or doctoral studies constitutes a particular writing practice for social science students who find themselves halfway between academic and professional disciplinary communities. As part of their academic activity, students are used to producing texts to be read mainly by professors and/or tutors. Articles and theses partially share such characteristics, even at the doctoral level, since they are required, read, and assessed within the academic community. However, students are also expected to write such texts as professionals, with the objective of being published and thus read by the corresponding research and professional community (Russell & Cortes, 2012). This dual purpose explains why we appoint them as *academic research texts*.

Academic research texts' characteristics are dynamic, and they evolve along with contextual academic demands and cultural changes. In recent years, doctoral programs have been transitioning from content to competency-based curricula, though they are not yet abandoning traditional outputs and practices. Thus, while in some disciplines (e.g., economics, psychology, and nursing) it

is increasingly frequent for students to write article-based theses instead of the traditional monographs, in other disciplinary fields (e.g., history, law, and philosophy), only traditional theses and dissertations are expected (Frick, 2019). These differences in the final outputs entail other more or less explicit changes in practices and research conceptualizations; among them, doing research (and writing) collaboratively within research teams, presenting and writing up preliminary results and advances for conferences, and developing international stays to collaborate with researchers at other institutions, often writing with them too. As a result of all of this, writing demands have increased and diversified, but without a corresponding shift in the kinds of support and training that students are given (Paré, 2019).

In all these cases, doctoral or even master's students are asked to position as professional writers while they are still students. They have to (learn how to) communicate with other researchers even though they are not yet full members of the research community (Lave & Wenger, 1991), and they are forced to contend with sophisticated genres (research articles, conferences proceedings, and papers) that are not usually required or taught at the undergraduate level and are thus largely unfamiliar to them. Moreover, when students are asked to write with other more experienced researchers, supervisors often fail to consider these asymmetrical relations or to take into account students' peripheral positions in these collaborative writing situations. This is especially disadvantageous to students from so-called peripheral linguistic contexts who aim to publish in English (Bazerman et al., 2012; Corcoran, 2019; Corcoran & Englander, 2016).

These constraints add layers of difficulty to the intrinsically challenging activity of research writing. Studies have shown that students find it extremely arduous to learn to write in research genres, especially articles (Berkenkotter et al., 1988; Lea & Stierer, 2000; Li, 2019; Li & Flowerdew, 2020), and that they tend to experience affective and cognitive contradictions when they attempt to bridge the gap between their previous practices and perceptions as writers and these new and more complex writing demands (Camps & Castelló, 2013; Castelló et al., 2013).

The available research results on how these contradictions impact students' writing processes and products point to several intertwined challenges. The first one is students' lack of strategies to effectively manage these highly dynamic and recursive writing processes and the cognitive burden that comes with them in a sustained way over time (van den Bergh & Rijlaarsdam, 2007; van den Bergh et al., 2016). The second challenge relates to students' scarce knowledge (and sometimes even naivety) about what genre is and does (Bazerman, 1988; Bazerman & Prior, 2003), and about how discourses develop within disciplines (Bazerman, 2008; 2012). This latter challenge adds rhetorical and social issues

to the cognitive burden involved with the former. Finally, research writing is one of the central tools that allows students to position themselves as researchers, and this, in turn, requires them to develop their own voices and authorial identities (Aitchison et al., 2012; Matsuda & Tardy, 2007; Nelson & Castelló, 2012; Tardy, 2012; Wisker, 2013; Wisker, 2015). These challenges affect the writing process as a whole, from the text ideation and organization to the word choice level, and impact students' cognitive, affective and identity development. Learning how to regulate thoughts, emotions, and actions when facing research writing is crucially necessary for students if they are to resolve the contradictions originating from such challenges.

CHARACTERIZING WRITING REGULATION PROCESSES: SELF-REGULATION, CO-REGULATION, AND SOCIALLY SHARED REGULATION

According to our research writing conceptualization, we have defined writing regulation as a complex, recursive, and socially situated activity that involves cyclical thought-action-emotion dynamics (Castelló et al., 2013; Sala-Bubaré et al., 2021). Moreover, writing regulation processes take place at all the textual levels (from word to disciplinary discourse-levels) and throughout the writing process. It consists of both explicit decision-making processes and implicit adjustments (Iñesta & Castelló, 2012), which can serve different purposes and functions. This definition is embedded in a dynamic and socially situated approach to self-regulation that has not been frequent in writing research, especially in Higher Education (Sala-Bubaré & Castelló, 2018). While researchers have acknowledged the relevance of self-regulation, most of the studies addressing the socially situated dimension of writing have focused on other issues. The complexities inherent in this conceptualization pose methodological challenges to researchers seeking a fuller understanding of *cyclical thought-action-emotion dynamics* and *writers' ability to monitor their activity at varying levels of explicitness* when writing complex, lengthy research genres in specific disciplines (Iñesta & Castelló, 2012).

The first challenge arises from the approach to writers' thoughts and the actions they implement, which here cannot simply be categorized as "correct" or "incorrect," but must be viewed as more or less strategic or suitable to the writer's established goals. Such a perspective inevitably calls for a more carefully hedged and contextual analysis (Iñesta & Castelló, 2012; Castelló, 2002; Flowerdew & Wang, 2015).

The second challenge has to do with how we can understand and assess the writing process as a whole, from text ideation or planning and goal-setting to

revising and sharing final products. The question, in other words, is how to analyze the processes responsible for the transition from thoughts (perceptions about writing, genres and strategies) to action. To unpack how this transition unfolds, we need to study writers-in-context and texts-as-artifacts of activity (Castelló, in press).

The third challenge derives from the conceptualization of dialogue as inherent to research writing. As mentioned above, this dialogue involves not only the writer(s) and the reader, but others' voices that are invoked in the minds of writer(s) such as those of colleagues, supervisors, or reviewers, among others (Prior, 2001). Accordingly, we need to identify those voices and examine their interplay with writers' writing processes in order to understand the extent to which writing regulation may be socially based (Castelló et al., 2010).

The last challenge refers to writers' development and appropriation of social, cultural, and historical practices associated with research writing (Bazerman & Prior, 2003). Examining this appropriation process requires clarifying the role of the individual and social dimensions of regulation. It is well-known that novice community members learn how to write and regulate their composition processes by participating in genuine discursive social practices. This participation is scaffolded by more advanced researchers, usually in a supervisory role, with the final aim of facilitating new researchers' appropriation of these tools, so that they will be able to use them autonomously and independently (Englert et al., 2006; Castelló et al., 2010). Through this *co-regulated activity*, supervisors and reviewers play an essential and indispensable role in the regulation process, as they offer new researchers different kinds of expertise and share the responsibility for their development (Järvelä et al., 2013; Hadwin et al., 2010).

Moreover, in collaborative professional writing scenarios, regulation is *socially shared* among all the voices that intervene at a certain level in text ideation, production, and publication (Castelló et al., 2010). Socially shared regulation is a collective regulatory activity, wherein processes and products are distributed throughout the group, and at the same time are the responsibility of each one of the individual subjects that make up the group. Research carried out from this perspective seeks to analyze both the shared regulation processes executed by a group and the self-regulation processes that the group members use to regulate other members or the group as a whole (Malmberg et al., 2017; Hadwin et al., 2017). Understanding the dynamics of socially-shared regulation, co-regulation, and self-regulation also means analyzing the interplay between individuals' positioning within the group—or disciplinary community—and their personal thoughts and actions in a particular writing situation.

Studies on writing regulation in higher education have increased in number and expanded in scope over the last twenty years (Sala-Bubaré & Castelló, 2018).

These studies mostly look at writers' activity through retrospective self-reports or text analysis, either separately or simultaneously. Researchers rarely observe on-line writing processes and their unfolding to understand how writers overcome challenges and difficulties that arise during writing and regulate their activity. In the few studies that have collected data on online processes, activity contexts are altered and participants write in controlled experimental conditions, in which the texts' length, purposes and rhetorical complexity are usually reduced. Other studies that do preserve activity contexts and genre complexity tend to rely on discursive data and writers' representations.

Each research writing situation (e.g., writing a scientific article) has its own history and it is situated within a particular constellation of contextual conditions that are both individual and disciplinary in nature, as Bazerman has astutely highlighted (1988; 2012; Bazerman & Prior, 2003). Consequently, any analysis should be anchored in these specific writing situations if it is to approach writing regulation as it truly develops.

STUDYING WRITING REGULATION FROM A SITUATED PERSPECTIVE: CONCEPTUAL AND METHODOLOGICAL ISSUES

Our team attempts to address the above-mentioned challenges in the study of writing regulation processes, with the aim of combining the analysis of writers' activity and their text development in communicative ecological situations in a range of contexts (Sala-Bubaré & Castelló, 2018; Iñesta & Castelló, 2012). Moreover, in line with current approaches on self-regulated learning that argue in favor of going beyond the analysis of isolated actions (Hadwin et al., 2017), we strive to identify the patterns in which actions are organized and given a situated meaning. To this end, we have tried to design our studies according to certain shared premises.

First, we adopt the notion of episodes—integrated by purposely in-context activities—as an alternative unit of analysis (Iñesta & Castelló, 2012; Castelló et al., 2013; Sala-Bubare et al., 2021), since we are interested in understanding the interplay between texts' development and writers' activity. This approach involves collecting and analyzing data simultaneously about what writers feel, do, and think (practices and conceptions) in an attempt to look at both the cognitive aspects and the social nature of writing. Second, we look for designs that guarantee individual interpretations and actions are not studied in isolation from the ecological conditions where they originate and within which they have meaning. Thus, we try to ensure that these designs combine qualitative and quantitative data in order to comprehensively integrate different analyses (of

the social, textual, interactive, cognitive, and affective spheres). Finally, in light of the developmental nature of writing (Bazerman, 2013), and specifically its contribution to researcher development (Castelló, in press), whenever possible we have prioritized longitudinal designs in order to further our understanding of how research and writing conceptions, as well as practices and texts, intertwine and contribute to this development.

Awareness, Emotions and Stance (voice), Critical Components of Writing Regulation

Our earliest attempts to study writing regulation from a situated perspective took the form of two studies focusing on how doctoral students overcome difficulties when writing their theses (Castelló et al., 2009; Castelló et al., 2010). As in the other studies I refer to below, master's and Ph.D. students participated in a writing seminar that I designed and have been carrying out with other colleagues for more than fifteen years now. The writing seminar is peer review-based and encourages students to use drafts and intermediate texts as tools to drive co-regulation practice over a semester (Castelló, in press; Castelló et al., 2013). In our earliest studies, we collected data from individual interviews, writing diaries, and in-class pair discussion. These data provided information about the doctoral students' knowledge and conceptions about writing a thesis, as well as about their writing processes and their emotions. We also traced their writing activity by looking at series of drafts and revision strategies. Finally, we assessed the quality of the final text. The results showed text quality increased when students were able to explicitly associate their difficulties with specific problem-solving strategies. Notably, we observed that students' awareness of their writing processes correlated with their efforts to make their voices visible in their texts through the more or less strategic use of discursive mechanisms aimed at increasing authorial positioning and readers' engagement (Guinda & Hyland, 2012; Matsuda & Tardy, 2007). Moreover, those students who were more aware of their processes and difficulties tended to revise their texts at the structural and voice level. On the contrary, students that were less able to identify challenges and difficulties and were less aware of how these challenges interfered with their writing processes tended to revise their texts on a more superficial (lexical and grammatical) level. Those students who were less aware of their writing processes and strategies felt more anxious during that process.

From my perspective, the most relevant contribution of these first studies is they provided evidence regarding how co-regulation precedes—and in some cases is a precondition—for writers' self-regulation (Castelló et al., 2010). Peer discussion allowed writers to notice problems both in their texts and their

writing conceptions, issues that in many cases had not been visible when revising their texts individually, nor even when reading peer reviews. As others also noted (Rogers, 2008; Negretti & Mežek, 2019), it was through interaction, when students in their reviewer role had to justify their comments, that writers were able to appropriate reviewers' suggestions. Even though in some cases they initially might not fully agree with those comments, when they reviewed their texts consistently and put the suggested strategies into action, they tended to realize that peer-review based discussions were key for them to understand the reasons underlying text improvement and that these interactions made writing self-regulation possible. This evidence challenges the naive idea of writing self- and co-regulation development as resulting from a unidirectional process of internalization, thus, in Bazerman's words "*creating a loop of individual and group development*" as I discuss in the final section of this chapter (2012).

A second contribution has to do with the methodological attempt to relate writing conceptions, perceived challenges or difficulties, and writing and revision strategies, which was the precursor of the regulation episodes notion we adopted later. We tried to perform a combined analysis of challenges and strategies used by particular groups of writers. Yet, in those studies, both challenges and strategies were treated as independent units of analysis, and our analysis of writers was not person-centered, but variable-centered. Moreover, except for looking at the evolution of drafts, we did not have any access to the online writing processes but relied instead on writers' retrospective reports and interactive draft-based discussions.

Writing Regulation as a Two-Layered System

The second study I want to refer to focused on how writing regulation occurs in real time (Castelló & Iñesta, 2012). We followed two expert writers while they produced an article in their field, educational psychology. Unlike the previous studies, in this case we combined the analysis of what the writers had planned and expected to do with what they actually did, the unfolding writing activity, through screen recordings of all the writing sessions until they finished the article, and for the first time we included the regulation episode as an integrated unit of analysis.

The analysis of these video-recorded actions revealed evidence of the explicit challenges identified by writers and the subsequent actions they took to solve each of those particular challenges. These sequences of actions were consistent with our definition of writing regulation episodes as both intentional and conscious. However, we also identified sequences of actions, which were aimed at reformulating or adjusting the written text, thus showing an intention to address

a challenge, despite writers not making any explicit reference to it in the interviews or writing logs they completed during the writing process. We labeled such sequences of actions Implicit Regulation Episodes (IREs).

Consequently, we argue that writing regulation from a sociocultural perspective might be conceived as a two-layered system, with each level representing different types of episodes accounting for some particularities of the writing regulation activity dynamics. These two types of episodes differ mainly in their level of explicitness. Whereas in some cases writers mentioned facing more or less specific challenges and were aware of how they tried to solve them, in other situations they were not so conscious of this process. In those latter situations, recordings of their writing processes offered evidence of regulatory activity, yet this activity was implicit. This evidence of implicit regulation indicates that writers, especially those with extensive experience, might use some regulation strategies and mechanisms to adjust texts to disciplinary and research communities' ways of thinking without even being aware of them. Moreover, this implicit regulation seems to affect more local textual challenges (e.g., hedging sentences), whereas the explicit regulation episodes tend to address broader issues (e.g., organizing sections) (Castelló & Iñesta, 2012).

A second distinction between these two types of episodes relates to the significance of the time dimension in the dynamics of writing regulation activity. Our results revealed a morphological difference in both implicit and explicit types of regulation. In some regulation episodes, the challenge and the solutions are cited and implemented in the same writing session. We called these continuous regulation episodes. Meanwhile, discontinuous regulation episodes were those where the challenge and the solutions are cited and implemented over the course of multiple writing sessions.

Looking at these continuous and discontinuous episodes offers some new insight on the recursive nature of regulation. Even in the case of continuous regulation episodes, writers appear to implement actions associated with a particular intentionality at different times during the same writing session. Moreover, the interplay of continuous and discontinuous episodes also accounts for the writers' sustained efforts to fit their representation of the communicative situation with the evolving text during the writing activity, and how this representation is reviewed and recreated through time, specifically when dealing with complex texts such as scientific articles (Iñesta & Castelló, 2012).

CONTRADICTIONS AS DRIVERS OF WRITING REGULATION LEARNING

A major concern regarding researcher writing development is how to promote students' writing regulation, or in other words how to provide educational

guidelines to help students and early career researchers appropriate the knowledge and strategies that more experienced researchers implicitly or explicitly display when writing complex texts. We have addressed this concern in two studies of Ph.D. students writing their first article. The students participated in a seminar, similar to the one described above, intended to help them to deal with this new genre (Castelló et al., 2013; Sala-Bubaré et al., 2021). One of these studies focused on identifying and explaining the contradictions students had to confront when writing and the efforts to connect such contradictions with their attempted solutions. As in the previous study, we brought together data concerning what writers thought and did in real time and under natural conditions, and we used regulation episodes as a comprehensive unit of analysis.

A significant contribution from this study is related to our understanding of how, when, and why certain regulation episodes affect texts and writers' development. Doctoral students reported feeling challenged when trying to manage the writing process without reducing its complexity, and when attempting to cope with genre uncertainty, specifically with their limited knowledge of article constraints and affordances. Those challenges were overcome via regulation episodes aimed at redefining the output, considering the text a tool to think instead of looking for a perfect final product. Only when students appropriated these regulation strategies and consistently modified their thoughts about the texts they were writing and research genres were they able to make substantial changes to their drafts and increase the quality of their final texts. We have evidence of how this appropriation is socially driven, again thanks to the socially shared-regulation practices wherein students acting as reviewers suggested strategies that they had been unable to generate by themselves previously when acting as writers and that through in-class discussions are further refined and transformed into authorial decisions (Castelló et al., 2013; Castelló, 2021).

Students felt also challenged due to their perception of themselves as on the periphery of the disciplinary community. They considered themselves outsiders or even impostors when trying to write an article as other consolidated researchers, who they referred to as "real researchers," would. These feelings and thoughts often remain implicit and regulating them appears difficult since this regulatory activity not only affects writing, but also has implications for other actions related to researcher development such as networking, publishing, and attending conferences.

The second study I want to refer to in this section features a methodological innovation aimed at complementing the previous analysis. We introduced the use of keystroke logging to achieve a more fine-grained micro-analysis of writing regulation processes (Sala-Bubaré et al., 2021). Though exploratory, the study may shed light on the socially-shared nature of writing regulation

processes and how to address this social aspect empirically. Specifically, data revealed variations in writing processes after participants had received peer and expert feedback. These changes had to do with moving away from writing exclusively with the goal of text progression and toward much more problem-solving oriented writing, an approach that focuses more on strategic decisions in relation to anticipated problems and challenges. Before receiving feedback and thus before discussing the text, the student's writing showed a linear, text-driven path aimed at producing text heavily based on sources, mainly previous texts. After feedback, besides producing text, the focus was also on adjusting the text's progression to meet expectations and resolve issues raised by reviewers; thus, writing regulation processes increased. As other studies have highlighted, regulation takes place at all the textual levels and throughout each writing session (Castelló & Iñesta, 2012; Hadwin et al., 2010; van den Bergh et al., 2016). Despite individual variations related to topic and genre knowledge, what can be inferred from this case study is that once most of the text had been produced and reflective work could start, feedback acted to trigger more strategic, flexible regulation processes, promoting knowledge-transforming approaches.

Additionally, our data hint at a relationship between regulation processes and participants' positions as researchers, understood as an individual's attributes and conceptions about research (which may also be visible in the text through the writer's voice) and as the place the individual occupies in relation to other researchers, research groups and communities (Lave & Wenger, 1991; Kamler, 2008; Prior & Bilbro, 2012; Morton & Storch, 2019). That relationship can be traced when connecting students' perceived strengths and weaknesses as writers with their writing regulation processes. It appears that the less secure they feel about research writing, the more they rely on the sources and feedback, and the more likely they are to have trouble entering into a dialogue with other authors' voices and with readers. Thus, their voices are less apparent in their texts. These issues were present in writers' interactions with their peers' voices as they gave and received feedback, and these socially shared instances of writing regulation had a significant impact on their texts (Sala-Bubaré et al., 2021). These preliminary insights may be corroborated or contradicted in future studies with a larger number of participants with diverse profiles and characteristics.

FINAL REMARKS: LESSONS LEARNED AS TEACHERS

So although internalized thought and self-regulation may follow the Vygotskian path of intermental to intramental, the consequent path of

> expression is from intramental to intermental—creating a loop of individ-
> ual and group development.
>
> <div align="right">- Charles Bazerman (2012)</div>

In this chapter, I have argued that a sociocultural writing regulation approach is crucial for early career researchers to develop as writers and researchers, I have examined the conceptual and methodological challenges of this approach, and I have discussed some of our team's attempts to address them. This last section is devoted to reflecting on how lessons learned from research enlighten us as teachers as we develop educational proposals and guidelines that effectively contribute to early-career researchers' abilities to strategically regulate their emotions, knowledge and actions when writing and, ultimately, to develop as writers and researchers.

The statement heading this section is one of the drivers of this reflection since it inspired my research on writing regulation. According to Bazerman, research writing self-regulation may result from the internalization of thoughts and strategies that developed writers share with early career researchers, who are usually less developed writers. In these joint writing endeavors, co-regulation happens, tacit or explicitly, and personal development follows the path from intermental to intramental. Consistent with this path, Rogoff's notion of apprenticeship (1995) has been used to describe how, through this supervisory relationship and a one-to-one educational model, doctoral or master's students usually come to understand what research writing is and how it works. Supervisory dialogue helps students adopt disciplinary ways of producing knowledge and engage with the process of research writing (Dysthe, 2002, p. 499) through instances of co-regulation (Negretti & Mežek, 2019). While this model might explain some aspects of personal writing development, it does not account for early career researchers' socialization in their communities as writers and researchers, much less consider the potential of those newcomers to modify these communities through their texts and discourses. How writers put into action—that is, externalize—their skills and knowledge in specific challenging communicative situations is still unclear. As Bazerman claimed, "if the internalized concept has serious developmental consequences and interacts with other functional systems (i.e., structures of concepts, affects, and mental practices mobilized in addressing problems or challenges—or what might be called purposive structures of thoughts and feelings), it will likely be substantially transformed as it reemerges" (2012; p. 268). Such transformation, thus, follows an opposite direction of internalization processes, as it depends on the linguistic and conceptual development of the self and its positioning in a particular system of activity and communicative situation. When referring to writing regulation, we should account for decisions regarding

linguistic, epistemic, and rhetoric choices and their articulation in a particular text are driven by writers intramental activity, fully aware of—and sensitive to—the characteristics, requirements, and constraints of their intermental landscape.

When it comes to research writing, the landscape is rapidly changing. Current concerns on doctoral education tend to focus on how to prepare the next generation of researchers so that they are able to conduct research in an ethical, responsible way that crosses disciplinary, national, and cultural boundaries, and to deal with relevant societal challenges. In the last ten years, the number of Ph.D. graduates working outside academia across different sectors and contexts has been increasing. In light of this, further questions have been raised as to whether present research education is effectively preparing graduates to truly enact science not only *for* but also *within* society. This generation of researchers will not only have to learn how to communicate their research; they will also need professional competencies to communicate with other professionals, disseminate their findings and convince funders. This wide range of communication competencies are necessary in the context of increasing diversity of genres and voices on multinational teams and in global settings (McAlpine et al., 2020; McAlpine et al., 2021; McAlpine & Castelló, in press).

Alternatives to the apprenticeship model have been proposed as additional ways of promoting early career researchers' appropriation of the aforementioned sophisticated researcher competencies and their writing development in socially situated settings. These models, anchored in the notions of community of practice and transformative learning (Castelló et al., 2013; Camps & Castelló, 2013), better account for the loop—in Bazerman's terms—of interpersonal and community or group development that characterizes researcher development. These teaching methods foster guided participation as a way of learning to write and publish in real-world conditions, while encouraging newcomers to adopt community and disciplinary tools and practices as they gradually take their own places within these communities.

Educational proposals based on these premises aim at promoting personal, interpersonal, and community writing development (Rogoff, 1995) while, in turn, requiring explicit efforts to navigate the social dimension of writing. Such an approach assumes that research texts are populated by several voices, even when they are written by a single author. In this context, it is critical that early career researchers confront authentic research writing situations in all their complexity. When it comes to research writing, as in other complex learning situations, the whole is more than the sum of its parts, and thus, simplifying writing situations as a pedagogical strategy to address novice writers' troubles might not be a good option (e.g., Castelló & Iñesta, 2012; Castelló et al., 2010; Castelló et al., 2013; Sala-Bubaré & Castelló, 2017; 2018).

From my perspective, fostering the development of strategic thinking when writing is one of the best ways to help students to deal with the complexity of research writing. Thus, I believe it is not only a matter of increasing students' knowledge about research writing, disciplinary content, and genre. What is relevant to learn is the interrelation of when, how, and why certain specific actions should be taken during the writing process, and how they contribute to the text and the writer's development. This is what writing regulation is about. Some key aspects of this regulation may be addressed by expert writers in an implicit way while affecting text production both at the macro (structural) and micro (local) levels, since it seems a huge amount of craftsmanship is involved in strategic text tailoring, though that craftsmanship usually remains invisible to the eyes of those who, like student researchers, would very much benefit from accessing and learning from it.

Finally, I would maintain that identity might be a useful articulating construct with the potential to address both individual and social issues and to promote individuals' harmonic development (Castelló & Iñesta, 2012; Castello et al., 2013). Though amorphous and elusive, the concept of identity has become central to the fields of writing development and researcher development in the last decade (Castelló et al., 2021). It is not currently possible—and perhaps not even appropriate—to provide a single, overarching definition of identity, considering the wide range of theoretical underpinnings characterizing research on identity. For educational purposes, the notion of identity trajectories might help to adjust guidelines and scaffolds to early career researchers' purposes, thoughts, and practices over time (past, present, and future) and to variations in writers' position in each researcher community. Moreover, considering that researchers have different positions of the self, according to the spheres of activity in which they act, educational proposals should adjust to how texts are used and mediate researchers' activity in each of these spheres (e.g., as teachers, as editors). Thus, we should help students to understand texts as artifacts-in-activity that evolve as they evolve as research writers and researchers. A scientific article is understood differently depending on whether the writer is using it as part of his or her thesis defense or is publishing it after graduating.

We still need to invest more research efforts in clarifying how reflection about authorial voice and the intentional use of mechanisms for constructing author identity through writing contribute to writing development. Still, I believe it might be a promising way to overcome some of the recurrent challenges students and early career researchers experience as they develop as research writers. Future research should also probably look at technologies and writing modalities throughout the lifespan and how they influence trajectories. Again, Bazerman is showing us the way forward for studies of writers' development:

"How they are developing as writers is closely tied to how they are developing as people" (2019).

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