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High School Boys' and Girls' Writing Conceptions and Writing Self-efficacy Beliefs: What is their Role  
in Writing Performance?

### *Abstract*

This study investigated the conceptions about writing and writing self-efficacy beliefs held by high school students in relation to the students' gender as well as their associations with writing achievement. The results show that female students have more sophisticated writing conceptions than their male counterparts but no gender differences were found in writing self-efficacy beliefs. In addition, results reveal that writing self-efficacy beliefs and gender play an important role in predicting writing performance and that writing performance is moderated by students' writing conceptions. Educational implications and further research are discussed.

Key words: self-efficacy, conceptions, writing-to-learn, synthesis, gender

## High school Boys' and Girls' Writing Conceptions and Writing Self-efficacy Beliefs: What is their Role in Writing Performance?

For several decades it has been held that one of the main aims of secondary education consists in educating students in the competences and strategies that will enable them to continue learning autonomously (OECD, 2002). Since a large part of this learning is done through written texts, such strategies must include reading and writing; there is no academic learning that can be disassociated from them. Today, there is general agreement that merely assigning reading and writing-to-learn tasks in academic settings is no guarantee that the use of such instruments directly translates into learning or, at least, does not guarantee meaningful learning: learning in terms of knowledge construction (Tynjälä, 2001). According to the findings of the international assessment such as the PISA report (OECD, 2009), the reading competences of Spanish secondary school students fall far short of those of competent readers who are able to use this tool for knowledge acquisition. It does not seem too much to suppose that, if written composition strategies had been assessed, the results would have been no better. These results can be attributed, at least in part, to the traditional teaching practices in high schools in Spain. As noted by Kozulin (2001), the practices and uses in which literacy intervenes are essential to explain the impact of writing and reading on learning. In this traditional context, writing is employed basically as an instrument for reproducing information and not for constructing knowledge. We make these assertions based on reviewing the research carried out in secondary education in our country. The use of reading and writing as learning instruments is not independent of the type of tasks teachers propose and which students have to carry out in academic settings. In a study conducted in Spain (Authors, 2005) we found that the most common school tasks are those requiring students to consult a single text and remember, paraphrase or summarize it. In contrast, tasks requiring students to consult two or more sources of information and make

an integrating synthesis of them are extremely infrequent. Making a synthesis of multiple texts is cognitively more demanding than writing a summary of a single text. Preparing a summary involves generating a new text by selecting, organizing, and connecting contents from the source text (Spivey, 1997), but it is possible to keep the same organizational pattern as that employed in the original text, thus producing a reduced isomorphic version of the text. Synthesizing several texts, however, requires elaborating an integrating idea or “*superproposition* from different macro propositions of multiple textual sources” (Segev-Miller, 2004), and taking decisions about the organizational structure to adopt in order to integrate the information from the different sources (Authors, 2009; Spivey, 1997). As such, producing a synthesis of multiple texts requires knowledge-transforming to a greater extent than making an isomorphic summary of a single source, which makes it a powerful ally of constructive learning. Likewise, our previous studies show that Spanish pupils have great difficulty in using writing epistemically –that is, to construct knowledge– in academic contexts (Authors, 2008; 2009). To a large extent, high school students lack the cognitive and metacognitive processes that would enable them to make strategic use of reading and writing. The search for possible explanations of such difficulties has led us inquire about the role students’ writing beliefs and conceptions may be playing. Students’ participation in social practices shaped according to certain conceptions of writing will contribute to how they learn to write and to an individual conception of writing and how they see themselves as writers. Thus, the personal conceptions are constructed within the framework of social conceptions about writing as well as within the writing practices promoted by these conceptions.

Over the last few decades students’ beliefs have received the attention of many researchers, as they play an important role in students’ performance. In the field of writing, in particular, writing self-efficacy beliefs have been found to be an important predictor variable in writing performance (Pajares, 2003). At

the present time, however, students' conceptions of writing, that is, the different ways students conceive and approach writing, seem to be another variable which can also influence students' performance in writing-to-learn tasks. Several studies have shown that students' beliefs about writing have a bearing on the quality of the texts they write (Campbell, Smith, & Brooker, 1998; Lavelle, Smith, & O'Ryan, 2002; White & Bruning, 2005). However, most of the work on this subject has been carried out with undergraduates and within Anglo Saxon cultural contexts. On the other hand, very little has focused on the relationship between students' academic writing conceptions and other writing beliefs such as self-efficacy beliefs. Also, gender seems to have an influence on different writing aspects and on writing performance (Department for Education and Skills, 2006; Peterson, 2006). Nevertheless, research about the role of gender on school writing is still needed (Peterson & Parr, 2012).

Within this context, this work had two goals. The first, of a more descriptive nature, was to characterise the conceptions of academic writing and writing self-efficacy beliefs held by Spanish high school students depending on their gender. The second aim of this piece of research, of a more explanatory nature, was to examine to what extent the degree of sophistication of writing conceptions and the degree of self-efficacy explain part of the variation in writing achievement.

The issues in regard to writing conceptions, writing self-efficacy beliefs and the relations between them and writing performance and gender will be introduced in the next three sections.

### *Writing conceptions*

The different ways of conceiving writing and its relationship to the strategies for tackling academic writing tasks and the resulting written products have been investigated from different approaches, such as metacognition (García & Fidalgo, 2004; Graham, Schwartz, & MacArthur, 1993; Raphael, Englert, &

Kirschner, 1989) and phenomenography (Campbell et al., 1998; Hounsell, 1984; Lavelle et al., 2002). The metacognitive approach is focused especially on the knowledge people have about their own cognitive processes that are involved in writing (planning, textualization and revision) and the way this knowledge influences the control we exercise over our own writing. Studies employing a phenomenographic approach explore the experiential or phenomonic aspects starting from the assumption that people experience writing phenomena in qualitatively different ways.

Recently, writing conceptions have been studied also using an implicit beliefs or implicit models approach. Whereas the metacognitive and phenomenographic approaches deal only with the explicit aspects of representations, on this perspective conceptions constitute models understood as sets of tacit, but systematic, beliefs. This is the perspective adopted by White and Bruning (2005). These authors have looked at university students' implicit writing beliefs in this way adapting their model about reading (Schraw & Bruning, 1996; Schraw, 2000) to writing. These beliefs inform us about the individual's level of engagement during a writing task. They distinguish between transmissional beliefs (beliefs that understand writing as a way of transferring information from the author to the reader and reflect limited cognitive and affective engagement during writing) and transactional beliefs (beliefs that conceive the purpose of writing as an active and personal construction of a text and reflect higher engagement). White and Bruning (2005) assume that these two models are independent of each other, so agreeing with the suppositions of one of them does not determine agreement with the suppositions of the other. They used a narrative text which they asked students to read and then respond in writing to a prompt that instructed them to discuss possible meanings of the story and make personal comments or provide a critical analysis of it. Each essay was scored on six writing (idea-content development, voice, word choice, sentence fluency, organization, and conventions) and the individual criterion scores totalled to create an overall

quality score for the essay. In order to examine the relations between writing beliefs and writing quality they distributed individuals into four groups that represented beliefs that were high transactional–high transactional, high transactional–low transactional, low transactional–high transactional, and low transactional–low transactional. Results showed that 1) students with low transactional writing beliefs had higher overall writing quality scores than students with high transactional beliefs and 2) students with low transactional beliefs scored lower on overall quality than those with high transactional beliefs. However, from a theoretical point of view, it could be expected that the configuration of more complex and coherent beliefs –high transactional beliefs and low transactional beliefs– would be linked to a higher overall writing quality. However, they did not find an interaction between transactional and transactional writing beliefs for ratings of written quality.

Employing an approach similar to the above, Authors (2009) studied the conceptions of high school and university students about writing. In this study, the framework adopted was *implicit theories* (Authors, 2006). According to this approach, conceptions are seen as constituting theories in the sense of epistemological, ontological and/or conceptual principles that are inaccessible to consciousness, yet underlie and restrict the way we approach and the way we interpret writing situations. Although the approach employed by White and Bruning is also located within the implicit model framework, our approach is not focused so much on the degree of personal involvement during the writing process as in the beliefs about the function of writing in learning and the role of the processes of planning, textualization and review, as can be seen in the description of the instrument used. Without diminishing the significance of the role of engagement in writing, in our case we were more interested in examining the role of writing conceptions on writing performance.

The purpose of our work (Authors, 2009) was to investigate students' theories in the writing domain and, in particular, the school writing domain. "School writing" here is taken to mean writing used in educational contexts for learning curricular contents. We employed a questionnaire to look at facets such as the uses and functions of writing, the role of planning and textualization processes, and the role of revising processes. This questionnaire, devised by the authors, explores both the beliefs students possess about writing and the actual practice they say they engage in as writers, as these are regarded as possibly complementary avenues for accessing students' conceptions about writing. Underlying students' reported beliefs and practices, as reflected in their answers to the questionnaire, there are two ways of conceiving of academic writing, one reproductive, the other one epistemic. Whereas the former conception implies a mechanical and linear process, the latter considers writing as a learning tool that is able to fulfill an epistemic function (See Table 1).

Table 1

*Writing Conceptions and Facets Explored in the Questionnaire*

Facets	Conceptions	
	Reproductive	Epistemic
Uses & functions	<p>Writing is not perceived as a learning tool, but rather as a set task basically serving to show what one knows. That is why the inclusion of the contents one intends to transmit and linguistic correctness are considered the only assessment criteria for a good text.</p> <p>Mastery of writing is based on practice and adherence to spelling rules.</p>	<p>Writing is considered a useful learning tool, so it is the student themselves who decides to carry out writing tasks.</p> <p>During the written composition process, attention is given to both conceptual and formal aspects to ensure they suit the writer's purpose. Likewise, this concern for suitability for the writer's aims is the best way to improve writing.</p>
Planning & textualisation	<p>The written composition process consists basically in "telling" what one knows.</p> <p>There is no planning or, if there is, it plays a minor role and the focus is on the contents.</p>	<p>Writing is understood as a complex, recursive process of making formal and conceptual decisions.</p> <p>Planning here is fundamental and involves taking into account factors concerning the task's context, aim and audience.</p>
Revision & modifications	<p>Revision is not very important either and concentrates on the more superficial, formal aspects.</p>	<p>Revision involves supervising formal aspects, but also adapting the contents and structure to suit the context. It is considered a recursive process allowing the writer to improve what they have written and their own knowledge.</p>

The results of this study indicate that, although university students display a more sophisticated and complex conception of writing than high school students – that is, high levels of epistemic



conceptions and low levels of reproductive conceptions-, undergraduates do not fully agree with the epistemic conception. Also, as in the study by White & Bruning (2005), it was no surprise to find that students were not wholly consistent in their responses and some students held both conceptions simultaneously.

On the other hand, several studies have shown a gender-effect in relation to various writing perceptions such as motivation (Pajares & Valiante, 2001), attitude to writing (Merisuo-Storm, 2006) or achievement task value perceptions (Meece, Glienke, & Askew, 2009), usually favouring girls. However, we are not aware of any studies that have investigated whether girls and boys differ in the way they conceive writing. Regarding performance, the same pattern has been found, girls usually show better competence ratings, and this result is explained referring to gender-role stereotypes and representations (Jones & Parr, 2012; Meece *et. al*, 2009; Mendez, Mihalas, & Hardesty, 2006; Peterson, 2006). Since girls show different psychological profiles and obtain better scores than boys, one possible mechanism for differences in writing performance could be mediation through epistemic conceptions. With this in mind, it is expected that girls maintain more epistemic conceptions as well as a higher writing performance than boys. Moreover, the differences in writing performance could be attributed, at least in part, to the differences observed in the writing conceptions.

### *Writing self-efficacy beliefs*

Writing self-efficacy beliefs refer to students' self-confidence in their writing capability (Zimmerman & Bandura, 1994). On this view, confidence in their own competence as writers will help students engaged in a writing task to generate greater interest and deal more appropriately with the obstacles that arise while performing it.

The most recent research has lent support to the view that self-efficacy beliefs are a more consistent predictor of writing outcomes than other motivational variables (e.g. writing apprehension or the perceived value of writing) and other types of self-belief (e.g. academic self-concept) (García & Salvador, 2006; Klassen, 2002; Pajares, 2003). Indeed, these studies have shown that writers' perceptions of efficacy are associated with various motivational variables (e.g. self-efficacy for self-regulation or achievement goal orientation) and mediate the effect of prior determinants (i.e. gender and pre-performance) on writing performance (see, for example, Pajares & Johnson, 1996).

Studies that have looked at writing self-efficacy beliefs in high school in the United States have found that students at this stage in their education display a considerable degree of confidence in their own writing skills (Pajares & Johnson, 1996; Pajares, 2007).

Attempts have also been made to investigate the relationship between gender and writing self-efficacy. However, so far the results have not been conclusive on this issue. Some researchers have found no gender differences in writing self-efficacy across academic grades (Shell, Colvin, & Bruning, 1995). Other studies have shown that girls are more modest than their classmates, even though their actual performance is similar or better (e.g. Pajares & Johnson, 1996; Pintrich & De Groot, 1990). Lastly, some researchers have found that girls report stronger confidence in their writing capabilities than boys (Pajares, Miller, & Johnson, 1999; Pajares & Valiante, 2001, 2006). Pajares (2003) attributes these different results to the students' age and the procedure for assessing self-efficacy, among other factors. Girls typically report stronger confidence in their writing capabilities than boys, at least through middle school and it is possible that these differences may diminish, or even be reversed, as students get older. Moreover, there were no gender differences in writing self-efficacy beliefs when measured in terms of differences reported

by boys and girls in the strength of their judgments of confidence that they possess various academic skills or can accomplish academic tasks. As Pajares (2003) suggests, because girls typically score better in writing performance indexes, this might mean that boys tend to be more self-congratulatory in their responses to these sorts of instruments, whereas girls tend to be more modest. However, when students were asked whether they were better writers than their peers, girls considered themselves better writers than the boys in their class and in their school, both at the elementary and middle school levels. In short, more information about gender influence in self-efficacy beliefs is needed (Meece et. al., 2009).

#### *Relations among writing conceptions, writing self-efficacy beliefs and writing performance*

From our point of view, both writing conceptions and writing self-efficacy beliefs are related to good writing performance. Thus, in order to carry out a writing task, a student would need to hold an epistemic view of writing and also perceive him or herself as competent in displaying the complex processes that an epistemic conception demands. If a student holds a reproductive writing conception or does not feel self-confidence to perform the task, he/she will probably not produce a high quality writing product. However, it is important to keep in mind that the proposed relationship could depend on the nature of the task assigned. As we mentioned before, the fact that writing is involved in performing numerous academic tasks does not automatically mean that when it is employed it is used epistemically and eventually leads to learning. If the tasks assigned do not require knowledge-building, but only reproduction of content, then there may be no advantage, and possibly significant disadvantages in terms of effort, if an epistemic stance is adopted towards the text, and therefore an epistemic conception would not be necessary in this situation.

Empirically, however, not many studies have looked at both writing conceptions and writing self-efficacy beliefs. Lavelle, Smith, and O’Ryan (2002) studied the relationships of high school students’ writing approaches to perceived self-regulatory efficacy for writing, the quality of their written essays and their grade in the subject in which they had to perform the writing task. Their findings suggest that the “Elaborative-Expressive” factor, a writing strategy based on personal investment and audience concern similar to our epistemic conception, is a negative predictor of the quality of the essay produced, whereas perceived self-regulatory efficacy was a positive predictor of both essay outcomes and grade. The authors’ explanation for these findings is that for high school students, the Elaborative-Expressive strategy may take up a lot of time; hence its association with inferior products in situations in which the time allowed for performing the task is short, as was the case for the task they set.

Maimon (2002) examined the relationship between first-year university students’ expectations of success or failure in regard to essay-writing and their ideas about the functions of writing in general. She proposed four possible functions -to organize, communicate, clarify and create something beautiful with words- and explored the extent to which the students employed them and enjoyed doing them. Her findings show that considering a greater variety of writing functions correlates with the production of longer texts and higher students’ self-efficacy scores.

In the study by White and Bruning (2005), which is the one most similar to ours, efficacy for writing was used to identify possible motivational correlates of implicit beliefs about writing. It was assessed by students’ confidence in performing a variety of writing-related tasks. They found a low significant correlation between transactional beliefs and writing efficacy, but not between transmissional beliefs and writing efficacy.

In summary, the findings of the research reviewed here indicate that there exists a certain relation between students' writing conceptions, their perception of themselves as writers and their performance on a specific task. Nevertheless, this relationship has hardly been investigated with high school students and, even when it has, the results have not been easy to interpret.

Since certain writing conceptions and self-efficacy beliefs are involved in writing tasks, we are interested in exploring whether, as has been found with regard to other writing factors, boys and girls at high school in Spain have different conceptions of academic writing. Concerning this first aim, our prediction was that girls in high school would have more epistemic views than their male peers (Hypothesis 1). Furthermore, it was expected from past research that gender may not affect self-efficacy beliefs (Hypothesis 2), when these are assessed by judging one's own writing skills separately rather than by comparing them to the skills of others, and that girls would perform better than boys on a writing task (Hypothesis 3).

We are also interested in investigating the influence of students' academic writing conceptions and writing self-efficacy beliefs on their writing performance in a complex writing task such as a discourse synthesis task. Writing a synthesis based on two texts, presenting complementary information about a particular topic was chosen for two reasons. In the first place, because it is a task that favors learning and secondly, because it was thought that, being a complex task, it would make it easier to observe the effect of a more reproductive or more epistemic conception than other simpler tasks. In terms of this second aim, and in light of previous research, we expected that self-efficacy would predict the quality of the text produced (Hypothesis 4). In addition, in this study we tested specifically an interaction between writing conceptions and their effect on writing performance: students with a high epistemic conception of writing will produce better pieces of writing only when they have low levels of agreement with the reproductive

conception of writing (Hypothesis 5). Lastly, in so far as girls in high school have more sophisticated (high epistemic — low reproductive) conceptions than boys, the relationship between gender and writing performance could be mediated by the degree of sophistication of writing conceptions (mediated moderation hypothesis) (Hypothesis 6). According to Jones and Parr (2012), gender may be masking other associated variables and therefore it was considered probable that the variation in writing performance associated to gender is in part due to the expected differences in writing conceptions.

## Method

### *Participants*

The sample of compulsory high school students comprised 111 fourth-year secondary education pupils – similar to 10<sup>th</sup> grade in the USA- with an average age of 15.6 years). 53.19% of the participants were boys and 46.81% were girls. The procedure employed for selecting the participants was convenience sampling, since voluntary participation was requested from their teachers. All students attended eight middle-class, state-run or grant-maintained schools in Madrid.

### *Materials*

#### *Writing conceptions questionnaire*

Conceptions were examined through a questionnaire designed for a broader research project (Authors, 2009). Answers were on a six-point Likert scale ranging from “totally disagree” to “totally agree”. The questionnaire contained two scales for identifying the two writing conceptions. The reproductive scale contained 14 items and the epistemic 15 items. Mean scores of individual items within the scale were calculated. The Cronbach Alpha values for each scale were .78 and .72, respectively. Each of the scales in the questionnaire was devised to explore various facets of writing that research in this field

has shown to be important (Hayes, 1996; McCutchen, 2006). Thus, the items concerning each of the two conceptions include statements about different ways of understanding the uses and functions of writing (10 items), the role of planning and textualization processes (10 items) and the role of revision processes (9 items). Examples of these items are given in Appendix 1.

In a previous study we tested the two-conception model represented by the reproductive and epistemic scales through a confirmatory factor analysis with a larger sample (Authors, 2009), using the LISREL 8.5.4 program (Jöreskog & Sörbom, 1996). The parameters were estimated using the method of *maximum likelihood*. According to the results of the confirmatory factor analysis, the two factor model showed good fit indices, whereas the 1-factor model did not (see Table 2). Therefore, the results supported the hypothesis that there are two independent writing conceptions underlying the questionnaire.

Table 2

*Goodness of fit statistics for the two models*

Indexes and recommended values	One-factor Model	Two-factors Model
Chi -Square	5468.11	914,.4
Degrees of freedom	406	376
RMSEA < 0,05	0.095	0.048
GFI > 0,90	0.78	0.91
CFI > 0,90	0.74	0.90
AGFI > 0,90	0.75	0.90

*Writing self-efficacy beliefs questionnaire*

An adapted version in Spanish of the skills subscale of the questionnaire used by Shell, Murphy and Bruning (1989) was used. This questionnaire contains a scale about writing skills self-efficacy beliefs

(5 items). Following Bandura's Guide (2001), the items in the questionnaire were related to the social sciences, as the students were asked to perform the writing task in the context of this subject. The Cronbach Alpha value was .79.

Students were asked to estimate, on a scale of 0 to 100, the degree of confidence with which they would be able to perform various skills (with (0) being "I can't do it"; (50) "fairly sure of being able to do it"; and (100) "I'm sure I can do it"). Sample items are given in Appendix 2. Mean scores of individual items within the scale were calculated.

#### *Texts for the written synthesis task*

Writing performance was examined through a written synthesis task. The texts were chosen from two Secondary Education social sciences textbooks and dealt with European imperialism, one of the subjects on the syllabus. The text entitled *Las motivaciones del Imperialismo* (Imperialism's Motivations) comprised two hundred and seven words and basically listed the motivations of imperialism. The passage entitled *Las causas de la colonización del siglo XIX* (The Causes of 19<sup>th</sup> Century Colonisation) comprised one hundred and seventy-seven words and referred to the causes in a more implicit and evaluative way.

#### *Procedure*

The questionnaires were administered by one of the researchers in two class sessions. First, the students were asked to fill in the self-efficacy beliefs questionnaire at the end of their lessons. In a period a week later, they completed the writing conceptions questionnaire and performed the written synthesis task. As a result of the questionnaires being administered in two different sessions and one class was away from the school on an extramural activity on the day of the second session, 75 students completed both.



The synthesis task was prepared together with the students' social sciences teachers and given to the students as a learning activity as part of that subject. Students were asked to read two different expository texts presenting complementary information about a social science topic and to write a synthesis of them. A synthesis was explained as a new text in which students were to integrate the main contributions of both the texts they were asked to read. The students were also told they were not expected to write a summary of the first text and then a summary of the second text, but a new text of their own—a synthesis—relating one text to the other. They were informed that they could take as much time as they needed in order to avoid a time limitation making the completion of the task more difficult.

The text presentation order was controlled for: 54.4% were given text A first, the other 45.6% being given text B first. No significant differences were found for the order of the texts. The total time taken by the participants ranged from 40 to 60 minutes.

### *Scoring*

The syntheses were assessed according to six criteria taking into account four analysis dimensions: the information included organization of the information, structure and formal aspects (see Table 3).

Table 3

*Dimensions of Analysis and Assessment Criteria of the Synthesis Products*

Score	Information included	Organisation of the information		Structure	Formal aspects	
	Selection of main ideas and exclusion of irrelevant ideas	Elaboration of the content and appropriateness of the interpretation	Cohesion and coherence	Way of relating and integrating the information	Independence with regard to the structure of the source text	Correct spelling, grammar and punctuation
4	The two most important main ideas are present (even though they may not be very clear) and also the other main ideas appeared (only one may be missed out). In addition, there cannot be more than one irrelevant detail.	Condensation and a certain degree of elaboration (generation of new ideas) or at least paraphrase showing an appropriate interpretation of the texts. Very little copying.	Includes sufficient appropriate devices (not copied from source).	Correct structuring axis; effective integration of information from both source texts. "Successful Synthesis".	Elaboration of a new structure of the student's own or substantial transformation of the original structure of the texts.	Completely correct text.
3	Some important ideas are present (perhaps not completely). There cannot be more than one or two irrelevant ideas.	Condensation and paraphrase (summarising, grouping ideas/phrases). Basically there is no copying. There may be some small inaccuracies.	Some devices, but there may be the odd connection failure. Sufficient mechanisms, but mostly copied from the source.	Incorrect or poorly elaborated structuring axis. Insufficient attempt to establish connections, for example by putting related contents from both texts together. "Failed Synthesis".	The student's text is based on the structure of one of the two source texts, but is adapted, either by changing the order of the paragraphs or combining it with that of the other text.	Text with one or two mistakes.
2	The two most important main ideas (or not clearly) are not present and the other ideas are incomplete, or only a couple of the main ideas are present. There may be several irrelevant ideas.	Little condensation. Paraphrasing of words and/or literal copying and/or small incorrect elaborations.	Insufficient devices, various connection failures.	There is no structuring axis. The contents are added together or alternated in a text or list of ideas. Both texts may also be condensed into one very short paragraph. "Non-Structured Synthesis".	The student basically follows the structure of one of the texts, altering it with slight modifications such as reducing the number of paragraphs.	Text with several mistakes.
1	There is no selection of the main ideas, so various irrelevant ideas are included, or only one or two of the main ideas appear.	Little condensation. Practically literal copy and/or important incorrect elaborations that distort the central thesis.	Clearly insufficient connection devices; ideas scarcely connected.	Information from both texts is used, but simply juxtaposed one after the other. Basically information from one of the two texts is used either in the form of a narrated text, or as a list of incomplete ideas. "Non-Synthesis".	Sticks to the structure of the source texts.	Text with numerous mistakes (5 or more).

Each synthesis was given a score from 1 to 4 on each of the six criteria, with 1 being the worst and 4 the best. One of the authors and another independent researcher scored 20% of the syntheses according to the same criterion. The Kappa statistic was calculated as a measure of inter-judge agreement. All the values were significant ( $p < .05$ ) with an average value of 0.781, and ranged from 0.589 (Cohesion) to 1.0

(Integration). A reliability analysis was performed on the set of criteria employed. Since the Alpha value was .70, the final score on writing performance was the mean of the scores of the six criteria.

## Results

In order to test the hypothesis put forward, we first focused on the differences between girls and boys in regard to the variables studied (Hypotheses 1-3). Second, we analyzed the relationships among these variables and their effect on writing performance (Hypotheses 4-6). To do this we performed a correlation analysis. Lastly, we investigated whether the assumptions required for parametric tests had been complied with. Since the data did not violate these assumptions we performed a hierarchical multiple regression analysis following the procedure established by Baron and Kenny (1986) in order to test the mediated moderation hypothesis between gender and writing performance.

### *Gender-related differences in writing conceptions, writing self-efficacy beliefs and writing performance*

Table 4 shows the means and standard deviations of all the variables in the study according to students' gender.

In order to compare the degree of sophistication of writing beliefs manifested by the students as a function of gender (Hypothesis 1), the scores on the reproductive and epistemic scales were tested on the basis of independent samples t-test. We expected that girls would have a more epistemic view than boys would. The analysis indicated that the level of agreement shown by girls with the epistemic conception was significantly higher than that shown by boys,  $t(109) = -4,355, p < .001, r = .38$ . In contrast, girls and boys showed an equivalent level of agreement with the reproductive scale (n.s.).

Table 4

*Descriptive Statistics for the Variables According to Students' Gender*

Variable	N	M	SD
<b>Reproductive conception</b>			
Boys	60	3.99	0.68
Girls	51	4.03	0.68
<b>Epistemic conception</b>			
Boys	60	3.84	0.76
Girls	51	4.43	0.63
<b>Writing self-efficacy beliefs</b>			
Boys	41	71.04	15.20
Girls	34	72.08	13.47
<b>Writing performance</b>			
Boys	60	2.13	0.63
Girls	51	2.36	0.55

To test Hypothesis 2, that is, that girls and boys would not differ in their self-efficacy beliefs, writing self-efficacy beliefs reported by boys and girls were compared by means of independent samples t-tests. No significant differences were found as a function of gender, and the students obtained a mean score of 71.56 on the writing self-efficacy questionnaire (SD = 14.34).

To test whether girls would perform better than boys on the synthesis (Hypothesis 3), the quality of the students' written syntheses was analyzed. The analysis showed significant differences in writing performance on the synthesis task: girls obtained better scores than boys ( $t(109) = -2.061, p < .05, r =$

.19). It should however be noted that the quality of the written products was rather poor ( $M = 2.24$ ,  $SD = 0.59$ ).

*Relations among writing conceptions, writing self-efficacy beliefs, gender and writing performance*

Table 5 presents means, standard deviations, skewness, kurtosis and Pearson correlations among the study variables. As expected, the results show that writing performance is positively associated with epistemic writing conception ( $p < .05$ ), self-efficacy beliefs ( $p < .05$ ) and gender ( $p < .05$ ), and negatively correlated with reproductive conception ( $p < .05$ ). Also, a positive correlation was found between gender and epistemic conception ( $p < .001$ ).

Table 5

*Descriptive Statistics and Correlation Matrix for the Variables.*

Variable	N	M	SD	Skew	Kurt	1	2	3	4	5
1.Reproductive conception	111	4.01	.6788	-.770	.680	-				
2.Epistemic conception	111	4.11	.7602	-.100	-.749	.150	-			
3.Writing self-efficacy beliefs	75	71.51	14.36	-.455	-.245	-.118	.088	-		
4.Writing performance	111	2.23	.6087	-.018	-.898	.199*	.194*	.332*	-	
5. Gender	111	1.46	0.501	-	-	.033	.385**	.138	.194*	-

$p < .05^*$ ;  $p < .01^{**}$  *R* (two-tailed test)

A hierarchical stepwise multiple regression analysis (Baron and Kenny, 1986; Frazier, Tix, & Barron, 2004) was conducted to test the hypothesis regarding the effect of self-efficacy writing beliefs on writing performance (Hypothesis 4); the moderating effect of writing conceptions (Hypothesis 5) and the mediated moderation between gender and, writing performance (Hypothesis 6). This analysis was only performed with the 75 cases who completed the two surveys on beliefs and carried out the synthesis.

First, we standardized the writing conception and self-efficacy belief variables. Second, we coded the categorical variable gender using dummy coding. Lastly, multiplicative terms of the standardized predictor variables (cf. Cohen & Cohen, 1983; Kleinbaum, Kupper, & Muller, 1988) were created to test the effects of the interaction (moderating variable). When the moderating variable acted as a criterion variable (step 1), multiplicative terms (epistemic conceptions x reproductive conceptions) were not standardized. The standardized variables were introduced into the equation in successive steps (cf. Aiken & West, 1991). The first step tested whether gender helped to explain the degree of sophistication of

writing conceptions, the first requisite for the mediation hypothesis. The second step compared the main effect of the predictor variables under study on the criterion variable (writing performance). The third step examined the moderation effect of writing conceptions on writing performance. Lastly, a Sobel test was conducted to test the mediated moderation hypothesis between gender and writing performance.

The results of the hierarchical moderated regression are presented in Table 6.

Table 6.

*Hierarchical multiple regression analysis predicting the quality of the writing product from gender, writing conceptions and writing self-efficacy beliefs*

Variable	Reproductive writing conception X Epistemic writing conception		Quality of the writing product	
	Step 1	Step 2	Step 3	
Gender	.272**	.359*	.311*	
Reproductive writing conception		-.109	-.107	
Epistemic writing conception		-.004	-.008	
Writing Self-efficacy beliefs		.126	.151*	
Reproductive writing conception x Epistemic writing conception				-.148*
R <sup>2</sup>	.066**	.169 *	.216**	
F <sup>v</sup>	8.733**	3.558*	3.813**	
Δ R <sup>2</sup>			.048*	
F for Δ R <sup>2</sup>			4.187*	

In Step 1, gender explained a significant amount of the variance in the degree of sophistication of students' writing conceptions (reproductive conception x epistemic conception), ( $\beta = .302, p < .01$ ).

In Step 2, when all the variables studied were introduced, only gender helped to predict students' writing performance ( $\beta = .291, p < .05$ ).

The results in Step 3 reveal that the moderating variable (interaction between reproductive writing conception and epistemic writing conception) helps to explain the variance ( $\beta = -.225; p < .05$ ). In order to evaluate the effect size associated with this result, we calculated partial-eta squared. The partial  $\eta^2$  for the interaction is .06, indicating a small size effect (Cohen & Cohen, 1983). Together with this interaction, self-efficacy beliefs (as predicted by Hypothesis 4) and gender (Hypothesis 3) help to explain the variability of the quality of the texts. The model was significant,  $F(5, 74) = 3.813, Mse = 1.22, p < .01$ , accounting for 21.6% of the variance in writing outcome, and explains a significantly greater amount of the variance than the previous model ( $\Delta R^2 = .048$ ).

As shown in Figure 1, as predicted by Hypothesis 5, examination of slopes indicates that students with high epistemic writing conceptions produced better-quality texts when they held low reproductive writing conceptions than when they held high reproductive conceptions. In contrast, students with low epistemic writing conceptions produced low-quality texts, irrespective of their reproductive writing conceptions. Results from a slope-difference test (Dawson & Richter, 2006) indicate a significant difference between the slopes ( $t(73) = -2.55; p < .05$ ).

Moreover, when the moderating variable (reproductive writing conception x epistemic writing conception) was included, the gender's  $\beta$  value was reduced. To test whether this reduction could be



attributed to the fact that relation between gender and writing performance was mediated by the degree of sophistication of writing beliefs (Hypothesis 6), the Sobel test (1982) was applied. The results were not significant, although they were very close to significance ( $z = -1.624$ ,  $p = .052$ ).

- Figure 1 over here -

Taking the results as a whole it can be said that students (both boys and girls) displaying more sophisticated writing beliefs (high epistemic and low reproductive writing conceptions) produced better quality texts. Although gender was related to writing performance, this relationship was not mediated by the degree of sophistication of students' conceptions, although the result approaches near significance. Lastly, self-efficacy beliefs help to explain the variability of product quality.

### Discussion

This study set out, firstly, to characterize the conceptions about academic writing, self-efficacy beliefs and writing performance manifested by Spanish high school students as a function of their gender. Secondly, it sought to analyze the role of these types of beliefs in writing performance in a subject in which students use writing as a fundamental learning tool.

In regard to the first aim, the results show, in accordance with our hypothesis, a gender effect in that boys and girls at high school differ in the way they conceive writing. In particular, whereas both groups showed equivalent levels of agreement with reproductive conception, girls showed higher levels of agreement with epistemic conception. In contrast, boys were not so aware of this tool's epistemic value. The results consistently show that girls have somewhat more sophisticated conceptions than their male counterparts, at least in high school education. Although girls tended to be slightly more in agreement with the epistemic scale it therefore appears that a "pure" epistemic view of writing is neither common nor intuitive at this educational level. Rather, on the contrary, it seems that girls also find it difficult to

conceive, or at least be fully aware, of the potential writing has for learning. This difficulty in becoming aware of the epistemic function of writing has also been detected by other authors (Boscolo, Arfé, & Quarisa, 2007; Ellis, Taylor, & Drury, 2006; García & Fidalgo, 2004; Prain & Hand, 1999) and, as we stressed next, it seems to be greater in the case of boys. Nevertheless, as they go up the educational ladder, students show greater agreement with epistemic conceptions and less agreement with reproductive views of writing (Authors, 2009; 2011). If girls continue to hold more sophisticated conceptions than their male peers, a change in pattern might be expected: whereas in high school girls construct more epistemic conceptions earlier than boys, they might also be the first to give up more reproductive conceptions at higher levels of the educational system.

In relation to the self-efficacy beliefs, the results show that high school students perceive themselves in general as competent writers in social sciences, as reflected in their high scores on the self-efficacy scale. These results are very similar to those obtained in previous studies with students of the same educational level (Pajares & Johnson, 1996; Pajares, 2007). However, the results of various pieces of research have highlighted the difficulties high school students in Spain have with written composition (see, for example, González & Martín, 2006), especially on tasks requiring complex writing skills (see, for example, Authors, 2008; 2009b), which might cast doubt on the accuracy of their perception of self-efficacy (Klassen, 2002). As will be seen below, this is also the case in this study. The discrepancy between self-efficacy and writing performance can be, at least in part, attributed to two questions. On the one hand, as some studies in Spain show (Authors, 2005), tasks which require complex writing processes such as synthesis are not usually set in class. This lack of familiarity could result in an inappropriate estimate of self-efficacy. On the other hand, the self-efficacy belief instrument used only assesses simple writing skills and not those which involve a complex task such as synthesis.

The large gender effect in writing conceptions contrasts with the lack of difference in self-efficacy beliefs. Girls and boys reported equal writing self-efficacy beliefs. This result is consistent with some other research (Shell et al., 1995). As Pajares (2003) suggests, at high school, which is equivalent to the levels studied here, these differences tend to disappear, especially when writing self-efficacy beliefs are assessed by students' judgments of the confidence that they possess various academic skills and can accomplish various academic tasks, instead of their being assessed by means of comparative judgments regarding their writing ability in respect of that of other boys and girls in their class and in their school. Another possible factor contributing to this result may be the lower level of complexity and the specificity of the writing skills explored. Some authors have found that girls' perceptions of self-efficacy are higher when more complex composition skills are assessed (Pajares, 2007).

Lastly, as expected, girls obtain higher scores in the synthesis task. Nevertheless, the quality of the syntheses was not high in either group, in spite of the fact that, in contrast to Lavelle et al.'s study (2002), they had as much time as they required to complete the task. This may be due to the high degree of difficulty of the task as it is a "hybrid" task that involves reading more than one text and writing another text integrating the information from them (Spivey, 1997). As already noted above, the difficulty these high school students had in producing written syntheses of multiple texts accords with the results of previous research (Authors, 2008; 2009; Lensky & Johns, 1997).

In sum, the results show that high school students in Spain hold reproductive and epistemic conceptions, perceive themselves as having a high degree of self-efficacy and perform poorly on complex writing tasks such as producing a synthesis of two or more texts. However, girls display greater agreement with the epistemic conception of writing and perform better on writing tasks than boys. These results are

coherent with the findings of other studies that have looked at the influence of gender on another set of factors that may also have a bearing on writing (Merisuo-Storm, 2006; Mendez, Mihalas & Hardesty, 2006; Pajares & Valiante, 2001; Peterson, 2006). These differences may be essentially related to the different role expectations that boys and girls are faced with at home and at school (Jones, 2012), but this interpretation cannot be drawn from the data reported here and must be the object of future research.

In regard to the second aim of this study –to investigate the relationship between girls’ and boys’ writing conceptions and writing self-efficacy beliefs and their influence on writing performance– the results partially support our expectations. As expected, writing conceptions are associated with writing performance. The correlations obtained show that the greater the agreement with the epistemic conception, the better the writing performance, and the greater the agreement with the reproductive conception, the poorer the writing performance. This is coherent with the findings of other research, albeit at the university level (White & Bruning, 2005). Nevertheless, the results of our regression analysis broaden and deepen previous findings in so far as they reveal an interaction between epistemic and reproductive conceptions. In particular, only students with a higher epistemic conception and a lower reproductive conception of writing produce higher quality syntheses. However, it is worthy to note the small effect size, as in White and Bruning’s work. In our case, several factors may have contributed to this. On the one hand, the synthesis task used to evaluate writing performance proved to be difficult for the students. As already mentioned, producing a written synthesis of various texts is a complex task requiring organizational skills and the ability to elaborate and integrate the different pieces of information selected from the sources. On the other hand, the students were not very familiar with the task of discourse synthesis (Authors, 2005), and it may be for that reason that their responses were simplified and approached from a less epistemological manner (Authors, 2008). In contrast, in White y Brunning’s study,

the students were instructed to produce more personal pieces of writing. In particular, they were asked to discuss possible meanings of the source text, make personal comments, connections or critically analyze the text they had read. The task of producing a piece of writing that requires a greater level of personal implication could help to orient the student, thereby facilitating differences depending on the writing conceptions. Finally, the nature of the text itself as well as the number of sources may have contributed to the effect size that was found. Thus, the texts that were used in our study -two background texts with complementary information regarding a particular topic- were selected from the different teaching materials that the teachers in this grade typically use in the classroom. However, in the study of White and Bruning they selected a narrative text regarding a topic that concerned daily life with the aim of facilitating the personal implication of the student and in order to more easily identify the differences in the quality of writing due to conceptions. With this in mind, we feel that studies exploring the influence of different types of beliefs on writing performance need to utilize other types of writing tasks, with a different level of complexity and different types of texts, in order to identify the factors that interact with the writing conceptions, buffering or maximizing their effect, on the quality of the student's writing composition.

Additionally, in accordance with previous research, gender is associated with writing performance. Moreover, our study has attempted to map the complex relationship between gender, writing conceptions and writing performance. Contrary to what was expected, the results on mediated moderation were not significant, although they did indicate a tendency. However, given that our sample was relatively small, we consider that future studies should investigate this relationship further before ruling out that one of the factors explaining the higher quality of the girls' written texts compared with that of the boys' may be the greater sophistication of the girls' writing conceptions.

Lastly, in keeping with the findings of other authors (Lavelle et al. 2001; Pajares, 2003), self-efficacy predicts the quality of the text produced. To summarize, it would appear that, in addition to gender, the conceptions of self-efficacy and the degree of sophistication of the students' writing beliefs, predict writing performance.

At all events, it should be noted that the study has a number of limitations which mean the results must be taken with caution. On the one hand, the fact that the self-efficacy data of a group of students was missing meant the regression analyses were carried out on a relatively small sample. The smallness of the sample and the inclusion of several independent variables affect the power analysis. Since the power analysis provides information about the test's ability to detect an effect when a real effect exists, in this study it could be possible that the mediated moderation role of students' conceptions was unperceived. For that reason, we consider that it would be necessary to test the mediated moderation hypotheses with a larger sample in longitudinal studies. It would also be interesting to analyze the potential mediating role of the conceptions to see if it depends on the student's level of education and their experience with writing. However, in spite of the study's conditions, some effects were brought out, such as the role of writing conceptions on writing performance and the role of self-efficacy.

Furthermore, the scale used to assess self-efficacy included fairly simple writing skills, more to do with composing sentences and paragraphs than texts. In future research, the relation between self-efficacy and the more complex skills involved in producing a written synthesis should be explored.

In spite of the limitations pointed out, we believe our results can contribute to a better understanding of the role played by writing beliefs. Some of the results of this study are consistent with the evidence obtained in previous research, but there are various new contributions. These include an

analysis of the role played by writing conceptions in writing outcomes. Our research has revealed the interactive role of the two beliefs on writing, under conditions that may have minimized this effect. Moreover, it signals a tendency towards the mediating role of conceptions in the relationship between gender and writing performance; a tendency which should be investigated further.

The differences in the quality of texts produced in high school can thus be explained in part by students' writing conceptions. This is no doubt another original contribution. These results are particularly important, not only because they are new, but because, with a view to possible intervention, they appear to indicate the need to pay attention to the writing conceptions held by students, given the difficulties they have. The results point to the fact that it is hard to conceive, or at least be fully aware, of writing's potential for learning. Furthermore, the poor results obtained by high school students in regard to the quality of their syntheses are additional evidence of the need for these students to be given effective instruction in written composition. If, as has been postulated elsewhere (Authors, 2006), there exists a relation of mutual influence between conception and practice, it may be that one of the reasons why students in Spain do not use writing epistemically is that they conceive it basically as a mere vehicle for information. It is possible that in other cultural contexts, with different writing practices and gender stereotypes, that writing conceptions might vary, which is why it would be interesting to investigate this area further. Students would therefore need to give up their more reproductive conceptions and move towards a more epistemic view of writing in order to be able to use it as a powerful learning tool. To achieve this changeover, instruction ought to focus on regulation processes and metacognitive reflection (Graham, Harris & Larsen, 2001; Authors, 2006) and may require the provision of differential help depending on the degree of sophistication of the students' beliefs (Authors, 2012). The instrument employed in this study could well serve as a starting point for students to reflect on their own writing

conceptions. This reflection should not be confined to this specific activity, but continually encouraged across all subjects by getting students to perform writing tasks requiring them to process knowledge, and not just reproduce it. Students must therefore have the chance to tackle complex writing-to-learn tasks, as the role of writing experiences and practices in forming beliefs and shaping the way tasks are approached is fundamental (Ellis *et al.*, 2006; Levin & Wagner, 2006; Prain & Hand, 1999). Lastly, it seems extremely important to find out about the conceptions held by teaching staff at different educational levels. As teachers play a fundamental role in developing and changing their students' conceptions, there is a need to investigate how they conceive of writing.

A general conclusion might be that, in writing, developing an understanding of what writing is may be as important as developing students' confidence in their abilities. We hope these findings will contribute to a better understanding of the factors involved in academic writing and the teaching of such writing in high school education.

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Appendix 1

*Sample Questionnaire Items Concerning Conceptions of Academic Writing*

Facets	Scale	
	Reproductive	Epistemic
Uses and functions (N = 10)	I think the only important thing about a text is that it should include all the main ideas in logical order	Writing helps me to understand better what I think
Planning and textualization (N = 10)	I finish writing a text when I run out of ideas, when I can't think of anything else to say	While I am writing, I keep in mind who I am writing to or for
Revision and modifications (N = 9)	When I come back to what I have written, words and spelling mistakes are what I mainly correct	When I reread my text, a better way of expressing an idea often occurs to me

Note. Items are translated from Spanish

## Appendix 2

### *Sample Items from the Writing Self-Efficacy Beliefs Questionnaire*

1. Spell correctly all the words in a one-page-long Social Sciences essay
  
2. Write compound sentences with the appropriate punctuation (full stops, commas, etc.)  
and grammatical structure
  
3. Use full stops, commas, etc. correctly in a one-page-long Social Sciences essay
  
4. Organize several sentences into a paragraph so they express clearly an idea regarding a  
Social Sciences topic
  
5. Write a well-organized Social Sciences essay (with the ideas in order)

Note. Items are translated from Spanish