Pensamiento Educativo. Revista de Investigación Educacional Latinoamericana
2021, 59(2), 1-20

Pontificia Universidad Católica de Chile
Facultad de Educación

Oral and Written Language Interventions to Improve the Academic Competence of High-School Students

Intervenir en lengua oral y lengua escrita para mejorar las competencias académicas del alumnado de educación secundaria obligatoria

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Abstract

Oral and written language are constantly interrelated in literate communities. In this paper, we examined the repercussions of teaching argumentative oral discourse on the development of argumentative writing and vice versa. The participants were seventh-grade students, who were randomly assigned to one of three groups: the Oral-1 group, which received an oral language intervention first, followed by a written language intervention; the Esc-1 group, which received the written language intervention first, followed by the oral intervention, and the control group, who attended regular Spanish Language and Literature classes. We assessed measures of both oral and written argumentative discourse at pretest, posttest-1, and posttest-2 to determine the development of both intramodality and intermodality skills. The results showed that intramodality effects were larger for the written than for the oral language intervention. Both interventions produced intermodality effects. We concluded that the teaching of argumentative discourse should incorporate the bidirectional influences between the oral and written modalities.

Keywords: writing development, later language development, educational intervention, SRSD, Spanish

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ISSN:0719-0409 DDI:203.262, Santiago, Chile doi: 10.7764/PEL.58.2.2021.7

Resumen

La lengua oral y la lengua escrita están en constante relación en comunidades alfabetizadas. En este artículo se aborda cómo repercute la enseñanza del discurso argumentativo oral en el desarrollo del discurso argumentativo escrito, y viceversa. Los participantes fueron alumnos de 1º curso de educación secundaria, asignados aleatoriamente a una de tres condiciones: el grupo Oral-1 recibió una intervención en lengua oral primero y en lengua escrita después; el grupo Esc-1 recibió una intervención en lengua escrita primero y en lengua oral después, y un grupo de control, que recibió las clases habituales de Lengua y Literatura Castellana. Se realizaron evaluaciones pretest, postest-1 y postest-2 para determinar la mejora en habilidades intramodalidad e intermodalidad. Los resultados indicaron que los efectos intramodalidad de la intervención en lengua escrita fueron más contundentes que los de la intervención en lengua oral. Ambas intervenciones produjeron efectos de intermodalidad. Se concluye que la enseñanza del discurso argumentativo debe tener en cuenta las relaciones entre ambas modalidades.

Palabras clave: desarrollo de la lengua escrita, desarrollos tardíos del lenguaje, intervención educativa, SRSD, español

Spoken and written language are constantly interrelated in literate communities because oral language is reflected in written language in multiple ways and, in turn, written language defines a large part of the linguistic representations of speakers. The concept of *linguistic literacy*, proposed by Ravid and Tolchinsky (2002), captures the nature of the relationship between the two modalities of language, highlighting that the link between oral and written language is so close that it is practically impossible to understand the development of one without taking into account the impact of the other. Although oral language forms part of the basic cognitive development of human beings, many of its uses in specific communicative situations are acquired throughout schooling and beyond, in what is referred to as later language development. This term refers to linguistic development that occurs after the age of five, that is to say, when the basic aspects of language have already been acquired. Later language development is characterized by adding new (discursive) functions to elements that have already been acquired (Aparici, 2010; for a detailed description of the concept, see Tolchinsky, 2004).

On the other hand, written language and its mastery are essential to ensure academic, professional, and personal success. Therefore, effective teaching of oral and written language is a core educational challenge, which must take into account the relationship and possible synergies between both modalities of linguistic production. This paper describes an investigation of the relationship between oral and written language in the specific context of development of argumentation, understood as a discursive genre, that is to say, texts (oral or written) that respond to specific cultural expectations about their form and function, and that show a particular articulation of linguistic features associated with that genre (Biber, 2010; Biber & Conrad, 2009). Specifically, it looks at how the teaching of oral argumentative discourse impacts the development of written argumentative discourse and vice versa: how the teaching of written argumentative discourse impacts the development of oral argumentative discourse.

Relationship between oral language and written language

Oral and written language are characterized by their complementarity and reciprocal influence (Nelson, 2010; Ravid & Tolchinsky, 2002). Similar knowledge is used for each language component in both modalities; for example, phonological knowledge is applied to understand and produce speech, as well as for decoding during reading, or for spelling in writing (Caravolas et al., 2012; Gaskell & Marslen-Wilson, 1998). Furthermore, both oral and written language require morphosyntactic (Levesque, Kieffer, & Deacon, 2017; Treiman, 2017) and discursive (Kintsch & Van Dijk, 1978; Wen & Coker, 2020) representations to formulate messages. It is therefore unsurprising that previous studies have reported that oral language predicts written expression (Dockrell & Connelly, 2015; Spencer & Petersen, 2018) and, similarly, that certain aspects of written language promote the development of oral language (Hulme, Zhou, Tong, Lervåg, & Burgoyne, 2019; Martins & Silva, 2006; Perfetti, Beck, Bell, & Hugues, 1987; Vernon & Ferreiro, 1999).

However, the degree of transfer between the modalities (oral and written) depends on the discursive genre or subgenre (Vázquez, 2014). Each discursive genre is defined on the basis of a specific use of the linguistic repertoire; that is, there are discursive aspects that depend on the modality in which they occur. For example, within the same genre (e.g., narration, exposition), written texts usually contain more sophisticated vocabulary and greater syntactic complexity than spoken texts (Berman & Nir, 2010; Ravid & Berman, 2010). On the one hand, this is because written production allows one to go back over what is written; so, a complex sentence can be reread as many times as desired. At the same time, the delayed interaction between writer and reader in the written medium requires greater precision in expression, which is achieved with more rigorous vocabulary and complex syntactic structures (Ravid & Berman, 2010; Salas, 2010). At the same time, it has been suggested that the same genre (e.g., argumentation) follows similar developmental patterns in both modalities (oral and written). This could be due to the fact that, when arguing, the main objective of both modalities is the use of discursive techniques aimed to elicit individuals' adherence to a thesis based on arguments (Perelman, 1997).

In short, the development of discourse in the same genre, such as argumentative discourse, in the oral and written modalities shows common aspects and differences. It is therefore of educational interest to identify the potential to improve one of the modalities (e.g., written) through an intervention in the other modality (e.g., oral). The research addressed in this study could, therefore, have important practical implications (i.e., for teaching oral and written language) and theoretical implications (i.e., the bidirectional relationships between oral and written language).

Teaching oral and written language

In the Spanish education system, various communicative situations are examined with the objective of promoting students' competence in socially well-demarcated language uses (Decreto 187/2015). Of the various discursive genres on which work is done in classes, addressing argumentative discourse is a priority due to (1) the importance of argumentation for the construction and regulation of thought (Larraín, Freire, & Olivos, 2014); (2) the inherent difficulty of the genre (Coirier & Golder, 1993), and (3) the fact that argumentation skills continue to develop until advanced age (Felton & Kuhn, 2001; Golder & Coirier, 1996; Scholtz, Sadeck, Hodges, Lubben, & Braund, 2006).

Teaching oral argumentative discourse

Development of oral argumentation goes beyond adolescence (Felton & Kuhn, 2001). Teaching argumentation in high school classrooms should provide students with models and techniques to structure their arguments and act strategically (Dickinson & Tabors, 2001; Reznitskaya, Anderson, & Kuo, 2007; Telenius, Yli-Panula, Vesterinen, & Vauras, 2020). One type of pedagogical intervention, the Word Generation (WG) program, has

been shown to be effective in improving oral argumentation performance. It is based on promoting discussions in the classroom, explaining how to prepare coherent and effective arguments, and emphasizing academic uses of language (Duhaylongsod, 2017; Jones et al., 2019).

WG is characterized by introducing controversial topics of discussion along with structured activities. It thus provides models of oral argumentative discourse and discussion strategies (Jones et al., 2019). On the other hand, academic language refers to linguistic resources often found in academic texts from different disciplines which tend to occur infrequently in colloquial language (Uccelli & Meneses, 2015). For example, academic language uses more words with derivational morphology (Kieffer & Lesaux, 2010), more formal connectors (e.g., in other words, possibly, certainly; Hyland, 2004), and sentences with more grammatically complex structures than those that usually appear in colloquial language (Taylor, Greenberg, Laures-Gore, & Wise, 2011), in addition to other linguistic resources (for a detailed description of the core academic language skills, see Uccelli et al., 2015; Meneses et al., 2018).

Combining classroom discussions with academic language teaching under the WG program improves discursive quality; that is, the ability to take a position regarding a thesis based on arguments, in addition to the ability to refute or support the arguments of others (Duhaylongsod, 2017). In this study, we applied a didactic intervention based on the WG model (SERP, n.d.).

Teaching written argumentation

The construction of written texts is a complex task that requires the orchestration of numerous processes and levels of linguistic representation (Alamargot & Chanquoy, 2001). Therefore, teaching writing should focus on providing explicit strategies for the different processes of written composition, as well as mobilizing discursive and linguistic knowledge. The Self-Regulated Strategy Development (SRSD) model for teaching writing consists of facilitating knowledge of the discursive features of texts (e.g., text structure), explaining writing processes (such as planning or revision), and promoting the use of self-regulation strategies (e.g., self-instruction, self-assessment), which help students to manage the various writing processes. In SRSD interventions, the teacher usually emphasizes positive attitudes toward writing and provides a model to use writing and self-regulation strategies. He or she also guides the student toward autonomous use of the strategies taught (Graham & Harris, 2018). The efficacy of SRSD for teaching writing has been shown in numerous studies and meta-analyses (Salas, Birello, & Ribas, 2020; Graham, McKewon, Kiuhara, & Harris, 2012; Graham & Perin, 2007). This study used an SRSD intervention to teach students how to plan argumentative texts.

The study

The main objective of the study was to explore the relationship between oral and written language, and specifically, the influence of the development of oral argumentation on the development of written argumentation and vice versa. In order to do this, we used a quasi-experimental methodology, in which three groups of students were randomly assigned to one of three groups: Oral-1, a group that received an intervention in oral language first, followed by one in written language; Esc-1, which received an intervention in written language first, followed by an intervention in oral language; and finally, a control group-class, which received the usual Spanish Language and Literature classes of the first-year curriculum of compulsory secondary education (CSE) (Decreto 187/2015). Assessments were carried out at three times: pretest, posttest-1 (at the end of the first intervention phase), and posttest-2 (at the end of the second phase). This design allowed us to test the effectiveness of each intervention on intramodality performance, testing, for example, the effectiveness of the written language intervention in

the Esc-1 group at the end of the first phase (posttest-1); that is, just after they had received the written language intervention. The design also allows intermodality influences to be tested, for instance, by checking the oral language level of the Esc-1 group in posttest-1, when they have not yet received the oral language intervention.

The study thus sought to answer two research questions. First, are the interventions implemented effective in improving intramodality performance? We hypothesized that the answer would be affirmative; that is to say, that the oral language intervention would improve oral language performance and the written language intervention would improve written language performance. This hypothesis is based on precedents of intramodality efficacy for both oral language interventions (Venville & Dawson, 2010) and written language interventions (Salas, Birello, & Ribas, 2020; Graham et al., 2012). Second, we asked: Is there evidence of intermodality effects? In this case, we also hypothesized that the answer would be yes; in other words, the oral language intervention would produce improvements in written language performance and vice versa, written language intervention would lead to improvements in oral language performance. This hypothesis is based on the concept of linguistic literacy; that is, on the fact that oral and written language influence each other throughout development in literate communities (Ravid & Tolchinsky, 2002).

Method

Participants

The participants were 50 students (*M* age = 12.3; SD = 0.77) in the first year of compulsory secondary education; that is, students in the transition from primary to secondary education. They came from a public high school in the province of Barcelona, Spain, a region where Catalan is the language of instruction. The students also receive Spanish Language classes in the same proportion as the rest of the state (Real Decreto 1105/2014). The students were organized into three class-groups. In accordance with the ethics committee of the university, the legal guardians of the students and the students themselves signed informed consent forms in order to take part in the study.

Because of the particular linguistic context of the participants, they were invited to complete a sociolinguistic questionnaire. Of the sample, 94.23% had received all of their compulsory education (from the age of six) in Catalonia, while only 5.77% had started their schooling in Catalonia afterwards. The linguistic characteristics of the sample reflect that, in family settings, 75% of the students spoke Spanish with their parents/legal guardians, 11.54% spoke Catalan, and the remaining 13.46% spoke other languages. With their siblings, 75.47% spoke Spanish, 7.69% spoke Catalan, and 3.85% spoke other languages. In social relationships, 100% of the sample used Spanish as the main language among friends and classmates. These data indicate that the study sample was mainly Spanish-speaking. With regard to the education level of the parents, 16.34% had completed university studies, 64.42% had completed compulsory secondary education or vocational training, and the remaining 20.19% had only completed primary education.

The students who participated were divided into three groups: an experimental group called Oral-1, formed by 16 students (nine girls) who received an intervention in the oral modality, followed by an intervention in the written modality; another experimental group called Esc-1, formed by 17 students (nine girls), who received an intervention in the written modality, followed by the intervention in the oral modality; and a control group, comprised of 17 students (seven girls), who received the usual classes in the subject of Spanish Language and Literature. The participants were randomly assigned to each group, keeping each student in his or her class-group; that is, each class-group was assigned to one of the three conditions.

The interventions

The educational interventions were carried out during the first semester of the school year, in sessions that took place either once or twice a week as a partial substitute for the syllabus of the Spanish Language and Literature subject. The interventions were carried out simultaneously in the two experimental groups to ensure comparability and were taught by the first author. The interventions had a duration of eight one-hour sessions. Thus, the total duration of both modalities was 16 sessions or hours, separated in the middle by three weeks before the change of condition (e.g., from oral to written).

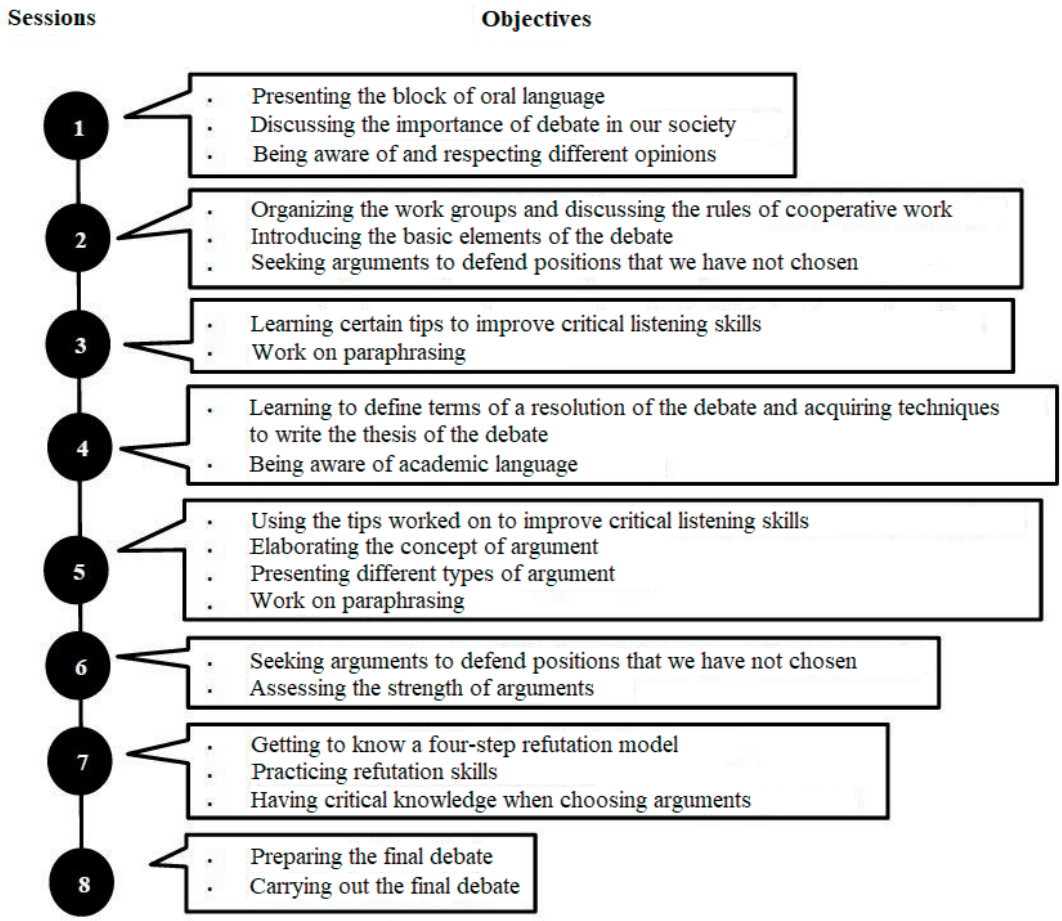

Figure 1. *Details of oral language intervention.*

Source: Prepared by the authors.

For the oral language intervention (Figure 1), we adapted some of the material from the Word Generation program for high school students. Specifically, six activities were selected from the program aimed at developing academic discussion and debate in the classroom. In the first session, the importance of developing speaking skills, presenting ideas in public, and discussing various topics while respecting other opinions was explained to the students. In this first session we worked with the Opinion Continuum© material, so that the students were able to take different positions on the same topic. In the second session we adapted the Opposite Perspectives© material on how to defend positions they do not share. The third session focused on the importance of verbal language and listening

based on the material adapted from Bonomo, Mamberti, and Miller (2010). In the fourth session, guidelines were given for proposing theses for debate using academic language with the material Taking it Up a Level©. The next session continued with activities to teach the students how to construct arguments to defend one's own point of view and the opposing one. We used an adaptation of the material Pro and Con© to carry out this activity. In sessions six and seven we continued working on argumentation, learning how to assess and differentiate the quality of arguments. We used the materials Rating Reasons© and Weighing the Evidence©. In session eight, the students conducted a final debate to put the strategies they had learned into practice. We also used resources from the book by Bonomo et al. (2010) to teach the students the characteristics and structure of debate through theoretical content.

All of the sessions in the oral language intervention had the same structure. In each of the eight sessions we explicitly worked on a set of lexical items and expressions to argue in academic language (Figure 2). At the beginning of each session, a previously selected text was read, along with the vocabulary to be worked on during the session. This was followed by an activity in which the students were asked to reflect and work on different strategies to be good speakers: refutation, active listening, and paraphrasing. Each session ended with a discussion to practice the concepts that were taught.

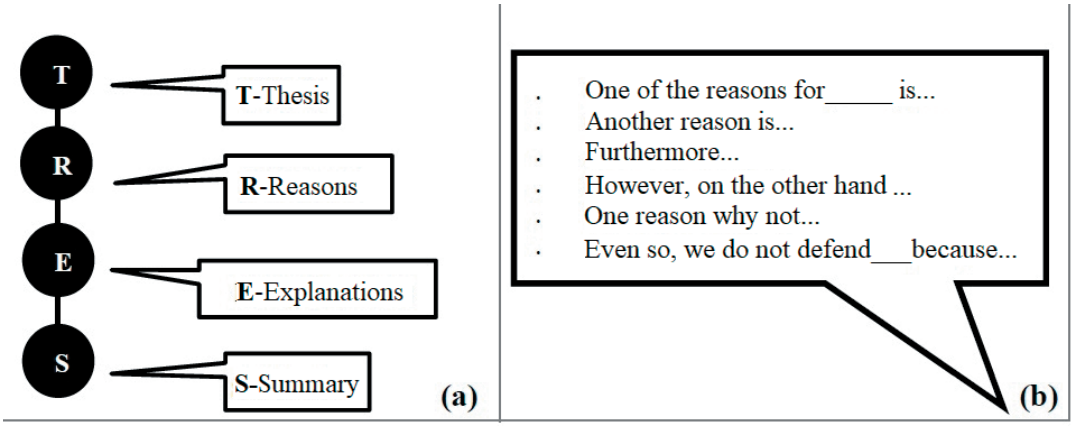

Figure 2. *Example of the intervention resources. In (a) the strategy for planning argumentative written texts is shown, while (b) shows an example of a set of lexical items and expressions for debating using academic language.*

Source: Prepared by the authors.

For the written language intervention (Figure 3), we adapted the intervention used by Salas, Birello, & Cros (en prep.) to Spanish, based on Graham and Harris' (2009) SRSD model, and aimed at teaching strategies for planning argumentative texts and for self-regulation. In the first three sessions, the intervention was devoted to mobilizing prior knowledge, introducing terminology, and presenting the writing strategy (Figure 2) and the self-regulation strategies. In the fourth session, the first author modeled the writing process using the strategies presented. In the fifth and sixth sessions, the students practiced the strategies with the help of a graphic organizer, while from the seventh session onwards, the students were asked to write without the support of the graphic organizer. In short, the intervention progressively shifted from the explicit modeling of writing and self-regulation strategies by the teacher to the autonomous use of these strategies by the students.

The students in all of the groups also completed a pretest one week before the start of the first phase of the intervention, a posttest-1, one week after the first phase of the intervention, and a posttest-2, one week after the second phase of the intervention.

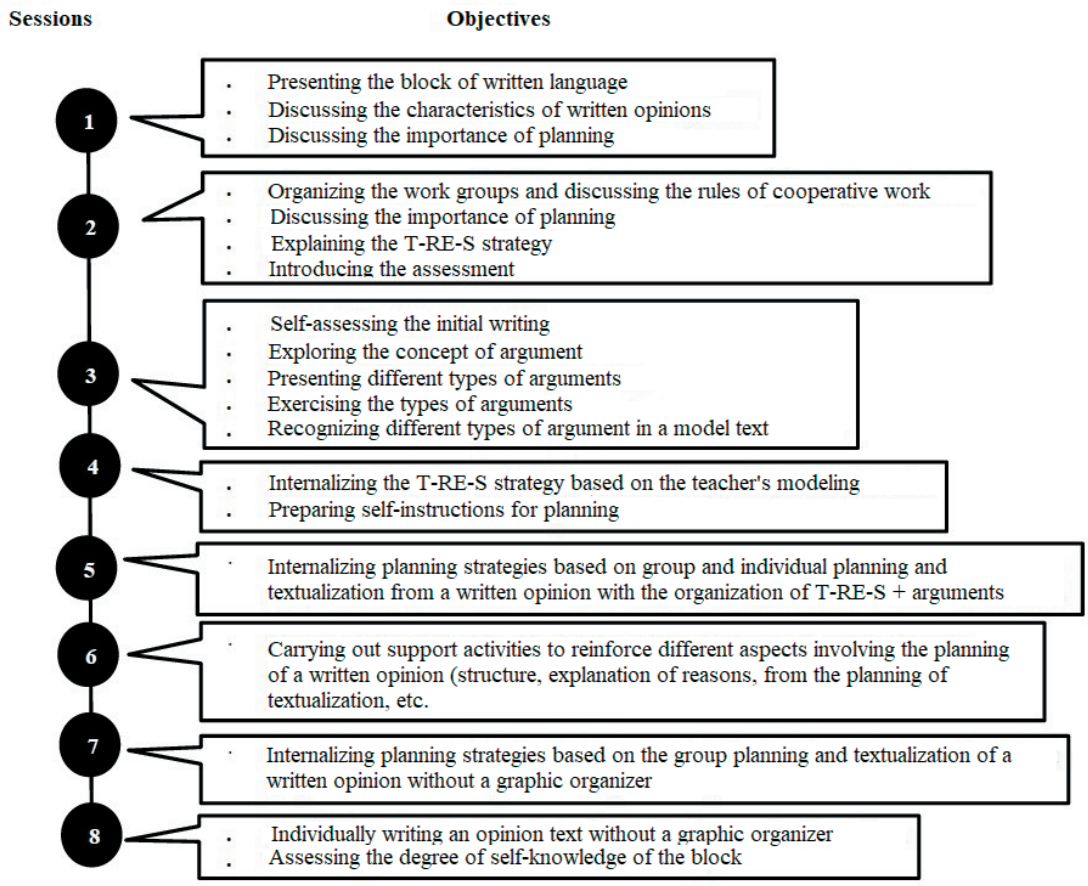

Figure 3. *Details of intervention in written language.*

Source: Prepared by the authors.

Oral and written language tasks

Oral argumentation

In groups of five students, the participants conducted a brief five-minute discussion based on a text read by the first author. At pretest, the text addressed child labor; in posttest-1 it addressed the intensive school day; and in posttest-2, it addressed teenagers' use of the internet.

Academic language

In order to determine the students' level of academic language, we used the Academic Language Assessment (ELA by the Spanish acronym), intended for Spanish-speaking students in grades 4-8 (Meneses et al., 2018). The instrument includes nine tasks that assess language knowledge at the lexical, grammatical, and discourse levels of resources specific to academic language. Note that, although it is a test that is carried out in writing, it reflects knowledge applicable to the argumentative genre that covers both oral and written uses. Given that the oral language intervention explicitly addressed the use of academic language in the context of discussion, it has primarily been considered an oral language measure in this study.

Written argumentation

The participants wrote an opinion essay for a maximum of 15 minutes. Before this, they were given up to eight minutes to plan the text on a draft sheet. In the pretest, the writing prompt was 'Do you think that everyone your age should have to do CSE?'; in posttest-1, the writing prompt was 'Do you think it is necessary to have more recess time?'; and in posttest-2, the writing prompt was 'Do you think it is better to use laptops than textbooks in high school?' The students did not receive any help in solving problems of content, structure, style, or spelling.

Measures

Quality of oral discourse

We transcribed and assessed the discussions using an adaptation of the Discussion Rubric© from the Word Generation program (WG; SERP, n.d.). The rubric contains a total of six dimensions: externalization of the student's point of view, use of evidence from the text, use of the ideas of others, use of academic language, argument style, and discussion engagement. Each dimension was given a score from 1 to 4, where the lowest score (1) corresponded to a rating of ineffective and the highest score (4) to a rating of effective. The final score was the sum of the scores for each dimension. The first author assessed all the transcripts, while a research assistant assessed 20% of the transcripts, selected at random. The inter-rater reliability (ICC) was .989.

Academic language

The ELA tasks are comprised of multiple-choice or forced-response items. In order to give each of the tasks equal weight, we calculated the proportion of correct answers in each task; therefore, the maximum score in each task ranged from 0 to 1, while the final score on the test ranged from 0 to 9. The first author assessed all of the protocols and a research assistant assessed the responses on 20% of the instruments, selected randomly. The reliability (ICC) was .996.

Quality of written text

The written texts were transcribed verbatim and then assessed to observe the extent to which they included structural elements typical of argumentative discourse (following Salas, Birello, & Ribas, 2020; Coirier & Golder, 1993; Limpo & Alves, 2013; Wagner et al., 2011). Specifically, one point was awarded for the presence of an introduction that provided context and one point for explicitly expressing the thesis or opinion. One point was also given if the text had a conclusion. A point was also awarded for each reason stated, as well as for each elaboration or explanation of the reasons. Points were only given for clearly observed elements and no partial scores were given (e.g., for incomplete reasons). The final score was the sum of all the elements included in the text by the student. The first author assessed all of the texts and a research assistant, not familiar with the objective of the study, assessed 20% of the texts, selected at random. The reliability (ICC) was .992.

Text length

We used the total word count to estimate the length of the text; in other words, the level of written language productivity, which is usually a proxy for overall quality that is established early in different languages (Salas & Caravolas, 2019; Berman & Verhoeven, 2002; Berman & Nir, 2010; Malvern, Richards, Chipere, & Durán 2004).

Spelling errors were not considered for word counts; therefore, if a word contained a spelling error it was added to the count in the same way as if it was spelled correctly. Lexical creations or occasional code switching to the other language spoken by the students (Catalan) were also included in the total word count.

Procedure

The pretest, posttest-1, and posttest-2 assessments were carried out by the first author. The oral argumentation test was conducted in a quiet room on school premises. The other tests were administered in the regular classroom. The various assessments were carried out in the third week of October (pretest), the third week of December (posttest-1), and the third week of February (posttest-2), always respecting the time allotted to the Spanish Language and Literature subject and without administering more than one test per day per group. The order of the tests was the same for all groups: oral language, written language, and academic language.

Analysis plan

For each of the measures of oral and written language, we performed a two-way, mixed analyses of variance (ANOVA): time, an within-subject variable with three values: pretest, posttest-1, posttest-2; and group, an inter-subject variable with three values: Oral-1, Esc-1, and control. For the analysis of the Time factor, we carried out planned comparisons (repeated method in SPSS v. 20 software) of the pretest>posttest-1 and posttest-1>posttest-2 intervals. For the analysis of the Group factor, post-hoc Bonferroni analyses were performed to determine whether belonging to any of the groups affected performance in each of the skills observed. Finally, we used the Bonferroni correction to follow up significant interactions.

Results

Table 1 shows the descriptive results of the pretest, posttest-1, and posttest-2 assessments of the two oral language skills observed: quality of oral discourse and academic language, and the two written language skills observed: quality of written text and text length. All variables had a normal distribution, with a maximum skewness of ±0.99 and a maximum kurtosis of ±1.4 (Kline, 2011).

Impact of the interventions on oral language learning

The time effect had a strong impact on the oral discourse quality, which underwent a significant improvement, $F(2, 90) = 89.57$; $p < .001$; $\eta^2_p = 0.666$. This improvement was observed both in the interval from pretest to posttest-1 ($p < .001$) and in the interval from posttest-1 to posttest-2 ($p < .001$). However, not all groups improved the quality of their performance in oral discourse to the same extent, as there was a comparatively smaller, but significant group effect, $F(2, 45) = 5.39$; $p = .008$; $\eta^2_p = 0.193$. The post-hoc analyses showed that the Oral-1 group experienced a significantly larger improvement than the control group ($p = .032$) and the Esc-1 group ($p = .012$), while the Esc-1 and control groups experienced similar improvements ($p > .05$). The interaction was not significant, $F(4, 90) = 2.28$; $p = .067$; $\eta^2_p = 0.092$.

Table 1
Descriptive statistics of the oral and written language measures for each group and time of collection.

	Oral-1 *M* (SD)	Esc-1 *M* (SD)	Control *M* (SD)
Pretest			
Quality of oral discourse	11.50 (5.24)	9.47 (2.57)	11.44 (2.38)
Quality of written text	4.13 (1.20)	3.47 (1.62)	3.82 (0.88)
Text length	86.50 (28.74)	64.76 (30.09)	77.71 (29.92)
Academic language	5.23 (1.98)	5.71 (1.46)	5.37 (1.39)
Posttest-1			
Quality of oral discourse	18.33 (4.35)	13.88 (4.24)	13.88 (3.99)
Quality of written text	5.80 (2.45)	8.59 (2.26)	3.47 (1.06)
Text length	98.93 (48.88)	119.88 (32.01)	59.18 (18.53)
Academic language	6.96 (0.98)	5.81 (1.30)	5.39 (1.40)
Posttest-2			
Quality of oral discourse	21.27 (3.32)	18.65 (3.82)	17.69 (4.02)
Quality of written text	10.73 (1.75)	10.38 (1.45)	3.65 (1.41)
Text length	146.07 (44.23)	132.06 (28.66)	56.35 (26.77)
Academic language	6.88 (0.90)	6.34 (1.30)	5.99 (1.38)

Source: Prepared by the authors.

The time effect had a moderate impact on academic language, $F(2, 86) = 26.22$; $p < .001$; $\eta^2_p = .379$, while there was no group main effect, $F(2, 43) = 2.29$; $p = .114$; $\eta^2_p = .096$. A significant, comparatively smaller interaction was observed, $F(4, 86) = 4.82$; $p = .001$; $\eta^2_p = .183$ (Figure 4). The follow-up of this interaction indicated that the simple effect of the time variable was significant for the Oral-1 group, $F(2, 26) = 6.55$; $p < .001$; $\eta^2_p = .574$, although only in the interval from pretest to posttest-1 ($p < .001$). The time effect was also significant for the Esc-1 group, $F(2, 30) = 2.47$; $p = .001$; $\eta^2_p = .352$, but only in the interval from posttest-1 to posttest-2 ($p = 0.018$). The simple time effect was only marginally significant for the control group[1], $F(1, 09; 16.41) = 6.88$; $p = .016$; $\eta^2_p = .314$, where only the interval from posttest-1 to posttest-2 was significant ($p = .017$)[2]. Meanwhile, the simple group effect was only significant in posttest-1, $F(2, 46) = 9.49$; $p = .007$. The post-hoc analyses determined that the Oral-1 group was superior to the control group ($p = .006$), while it did not differ from the Esc-1 group, and the control group and Esc-1 did not differ significantly from each other ($ps > .05$).

These results indicate that all of the groups improved their performance in oral language, regardless of whether they received an oral language intervention or not. The Oral-1 group, which received the oral language intervention at the beginning of the course, had a slight advantage over the other groups.

1. Due to the Bonferroni correction for multiple comparisons, the significance is interpreted as p values below 0.017.
2. Degrees of freedom are reported with the Greenhouse-Geisser correction, due to the significance of the Mauchly test of sphericity.

Impact of the interventions on Written language learning

The quality of the written texts improved in the successive assessments, as there was a strong main time effect, $F(2, 88) = 114.19$; $p < .001$; $\eta^2_p = 0.722$. However, not all of the groups improved the quality of their written texts to the same extent, as there was also a group effect of similar magnitude, $F(2, 44) = 55.34$; $p < .001$; $\eta^2_p = 0.716$. These effects were moderated by a significant time x group interaction, $F(4, 88) = 39.47$; $p < .001$; $\eta^2_p = 0.642$ (Figure 4). The simple time effect indicated that the Oral-1 group experienced significant improvements in both intervals, from pretest to posttest-1 ($p = .005$) and from posttest-1 to posttest-2 ($p < .001$). The Esc-1 group, on the other hand, only experienced a significant improvement in the first interval ($p < .001$), while the control group did not experience any significant improvement in any interval ($ps \geq .37$).

Meanwhile, the simple group effect was not significant in the quality score of the pretest written text ($p = .345$), whereas there were significant differences between groups in posttest-1 and posttest-2 ($ps < .001$). In posttest-1, the post hoc analyses showed that the Esc-1 group, which had just received the written language intervention, was superior to the other groups ($ps \leq .001$), while the Oral-1 group outperformed the control group on average ($p = .006$). In posttest-2, both the Esc-1 and Oral-1 groups outperformed the control group ($ps < .001$), although they did not differ significantly from each other ($p > .05$)

With regard to the effect of the interventions on text length, we observed a significant main time effect, $F(2, 88) = 23.64$; $p < .001$; $\eta^2_p = 0.349$. We also observed a significant group effect, $F(2, 44) = 18.12$; $p < .001$; $\eta^2_p = 0.452$. As with written text quality, these main effects were moderated by a significant interaction, $F(4, 88) = 20.36$; $p < .001$; $\eta^2_p = 0.481$ (Figure 4). The follow-up of the interaction indicated that the simple time effect in the first interval, pretest-posttest-1, was significant for the Esc-1 group ($p > .001$) and for the control group ($p = .003$). However, while the Esc-1 group included significantly more words on average in posttest-1 compared with the pretest, the control group included significantly fewer words (Table 1). In the second interval, only the Oral-1 group, which had just received the written language intervention, included significantly more words between posttest-1 and posttest-2 ($p = .001$), while the other two groups wrote texts of similar length. Meanwhile, the simple group effect indicated that, although all the groups wrote texts of similar length in the pretest ($ps > .05$), in posttest-1 and posttest-2 the Esc-1 and Oral-1 groups significantly outperformed the control group ($ps \leq .007$), although they did not differ from each other ($ps > .05$).

These results indicate that both intervention groups experienced improvements in written expression. On the other hand, the participants in the control group did not improve either the quality or the quantity of their opinion texts at any time during the study, despite having started with levels similar to those of the other two groups.

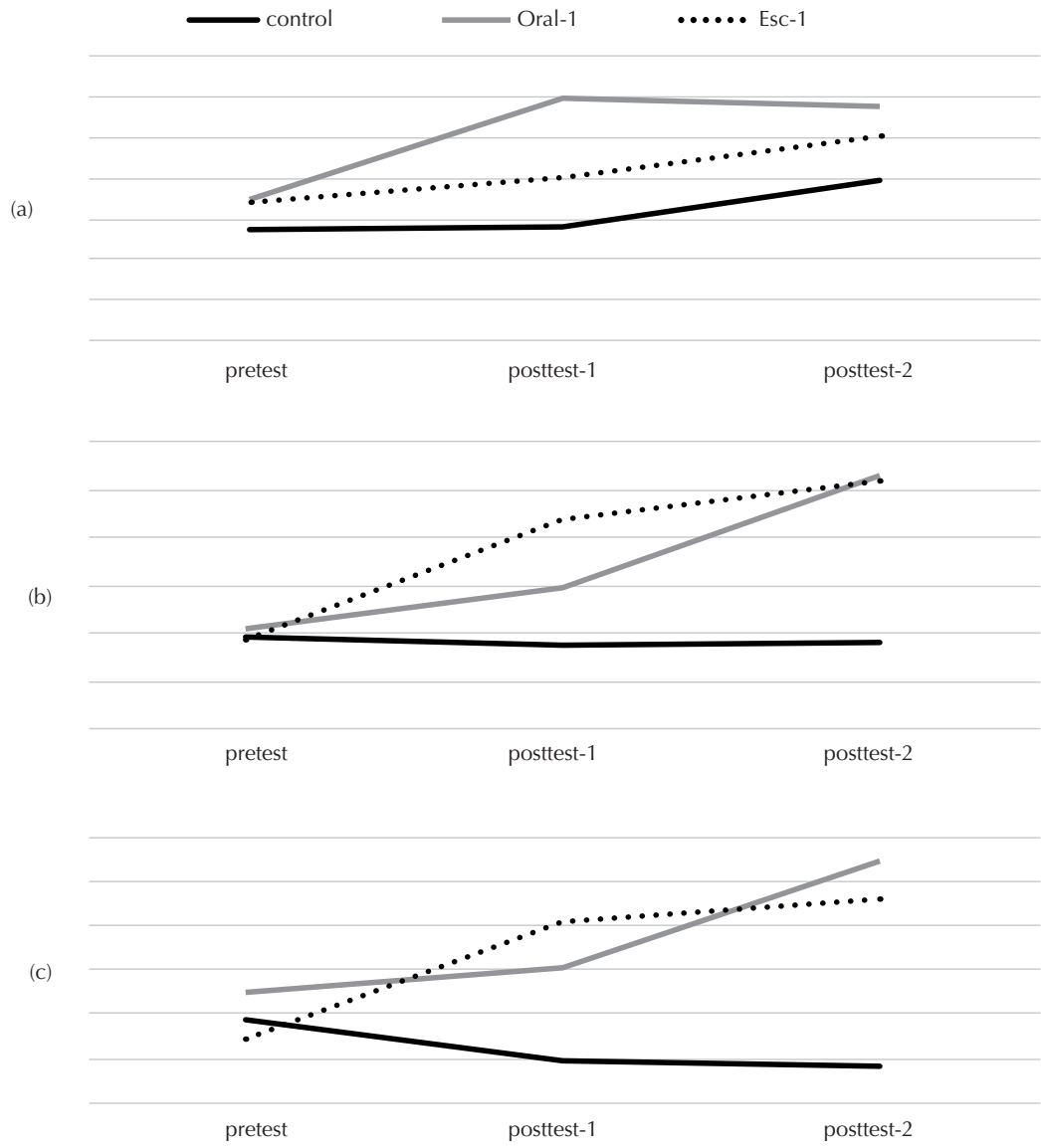

Figure 4. *Significant interactions between time and group for the variables (a) academic language, (b) quality of written text and (c) text length.*

Source: Prepared by the authors.

Discussion

In this study we set out to investigate the relationship between oral and written language in the context of the development of argumentative discourse. For this purpose, we implemented an intervention aimed at improving oral argumentative language and another intervention intended to improve written argumentative language. In this way, we examined intramodality (oral>oral; written>written) and intermodality (oral>written; written>oral) effects. First-year CSE students were divided into two groups: one group first received an oral language intervention, followed by a written language intervention, while another group received identical interventions, but which were implemented in the reverse order. Both groups were compared with a control group that received the usual classes in the Spanish Language and Literature subject. The groups were assessed prior to beginning the interventions, at the end of the first intervention, and at the end of the second intervention.

Intramodality effects

A first finding of this research is that both interventions showed significant intramodality effects: the oral language intervention improved the quality of oral argumentative discourse and academic language, and the written language intervention led to an improvement in the quality and quantity (text length in number of words) of the argumentative written texts produced by the participants. This finding is consistent with previous research that has shown the efficacy of the Word Generation program for teaching production of oral argumentative discourse (Duhaylongsod, 2017) and the SRSD program for teaching written expression (Salas, Birello, & Ribas, 2020; Graham & Perin, 2007; Graham et al., 2012).

However, there were significant differences in the effectiveness of the oral and written language interventions. The oral language intervention resulted in only a small advantage for the Oral-1 group over the other two groups. By the end of the study, all groups showed similar performance levels in oral argumentative discourse and academic language. This fact requires different interpretations for each of the groups. The Esc-1 group significantly improved its oral language performance, which was most likely due to (1) the oral language intervention in the second interval of the study and (2) the intermodality effects described in the next section. The improvement in the control group's performance in oral argumentative discourse, which was clearer in the second assessment period, may indicate that a few months of secondary education are sufficient to observe an increase similar to those of the intervention groups in terms of their ability to produce oral argumentative discourse and use academic language. Certainly, the transition from primary to secondary school in the Spanish educational system is characterized by going from a single teacher who teaches most of the curriculum to exposure to multiple teachers, each of whom is an expert in his or her subject. A similar result was reported by Lin, Lawrence, Snow, and Taylor (2016) , where significant improvements in oral communicative ability were also not observed in the intervention group compared with the control group. Previous research has also emphasized that progress in oral argumentative discourse in teenagers is slow and requires years of educational intervention to show significant differences compared with control groups (Kuhn & Crowell, 2011). Finally, it is surprising that the Oral-1 and Esc-1 groups differed from each other in the quality of oral argumentative discourse despite both receiving the same intervention, although at different times. In this respect, it is possible that the earlier intervention of the Oral-1 group served to drew the attention of the participants to certain resources and linguistic forms that are typical of this discourse genre from the start of the school year. Thus, the mobilization of linguistic representations from the beginning of the course, in addition to exposure to *expert* discourses typical of the secondary classroom environment, may have increased the effectiveness of the oral language intervention in this group. This result has important implications for the planning of language teaching in secondary school and requires research to corroborate the result in larger samples and for a longer follow-up period.

In contrast with the oral language intervention, the intramodality results of the written language intervention seem to suggest that written expression does not advance without explicit teaching of writing processes. That is to say, mere exposure to more or less academic uses of written language that are typical of secondary education appear to be insufficient to improve writing performance. In this regard, numerous studies have highlighted the importance of explicitly teaching the processes involved in writing, as well as working on self-regulation strategies that facilitate the execution of these processes (Burton, Nunes, & Evangelou, 2021; Graham & Harris, 2009; Kemper, Verhoeven & Bosman 2012).

Intermodality effects

As we hypothesized at the beginning of this study, we found empirical evidence of intermodality effects, in accordance with Ravid and Tolchinsky's (2002) linguistic literacy proposal. First, the intervention in oral argumentative discourse led to an improvement in written argumentative discourse. When looking at the improvement in the quality of the written text produced by the Oral-1 group in the first phase of the study (pretest to posttest-1), when the group had not yet received the written language intervention, we observed that they outperformed the control group. This result indicates that the work on debate and the explicit teaching of academic language in the oral modality resulted in an advantage when producing written argumentative discourse. This advantage was also observed both in the quality of the written texts, specifically, in the number of elements of discursive argumentation and in their length. These results are consistent with the widely held notion that the development of written language is at least partially supported by oral language (Griffin et al., 2004; Juel, Griffith, & Gough, 1986; Snowling & Hulme, 2020). In this study, the influence of one modality (oral) on the other (written) may have been reinforced by the fact that both interventions worked on the same discourse genre (argumentation) and that the oral intervention mobilized the generation of ideas, as well as the quality and structure of arguments.

It should be noted that we observed limitations on the positive effect of oral language on learning to write. Although the oral language intervention contributed to an improvement in written expression, the performance of the Oral-1 group in the first phase of the study was significantly inferior to that of the Esc-1 group, which had received the written language intervention. This again indicates that written language proficiency requires the teaching of modality-specific strategies. In other words, despite clear evidence of a transfer of knowledge from oral language to written language, writing proficiency also requires the explicit teaching of writing processes and other modality-specific knowledge (Graham & Perin, 2007).

The written language intervention also gave the Esc-1 group an advantage in academic language performance, as it showed no significant differences compared with the Oral-1 group in posttest-1 (i.e., when the Esc-1 group had only received the written language intervention). This indicates that the discursive representations mobilized in an SRSD intervention for argumentative writing also mobilize the linguistic repertoire of the academic register. Certainly, there are stable form-function relations between oral and written texts within the same genre (Berman & Verhoeven, 2002).

In short, explicit teaching of writing results in an improvement in learning of the oral modality and vice versa, in accordance with Ravid and Tolchinsky's (2002) linguistic literacy proposal that the development of language in one modality cannot be understood without reference to the other. However, while treatment of oral language typical of the secondary school setting seems to produce an intramodality benefit similar to that obtained from an intervention based on classroom discussions and the promotion of academic language, teaching of written language that provides writing and self-regulation strategies appears to be indispensable in order to obtain observable improvements in the construction of written argumentative discourse. These results imply that, notwithstanding the treatment of oral language in the secondary school classroom, the mastery of written language requires the teacher to provide explicit strategies to manage the complex task of producing high-quality argumentative texts. Work on such strategies in the classroom will likely need to be cross-cutting and sustained over time, although more research is needed on these nuances of teaching written language (Graham & Harris, 2018).

Educational Implications and Closing Remarks

One of the main implications of this study for teaching argumentative language in secondary school classrooms is that the teaching of oral language should be addressed as early as possible, from the beginning of the course. This teaching should point out to students aspects related to academic uses of language and encourage classroom discussions, drawing attention to the quality and structure of arguments. In this way, students will make more and better use of the opportunities to acquire and use their own repertoire of argumentative texts in the different disciplines.

Another important educational implication is related to the teaching of writing. The results of this study strongly indicate that teaching written expression must be explicit and should provide procedural facilitators and strategies.

In conclusion, the findings of this study add to the evidence accumulated so far that oral language and written language interact throughout the development of language (Berninger 2000; Berninger & Abbott, 2010; Davidson, 2019; Shanahan, MacArthur, Graham, & Fitzgerald, 2006), especially during later language development (Tolchinsky, 2004). Therefore, research on language acquisition at this stage should address the implications of the bidirectional relationships between the two modalities, without failing to note and explain the specificities in the learning of each discursive modality.

Limitations

One clear limitation of this study was its sample size. Once the total sample is divided into three groups, some of the comparisons with a clear trend did not produce significant results. Future studies should obtain larger samples in order to ensure the necessary statistical power to be able to answer the research questions posed in this paper more conclusively. Second, given that some skills (e.g., quality of oral argumentative discourse) may require to intervene over a longer period of time to show results, a longer intervention with a longitudinal follow-up of the different groups would help us to more robustly determine the extent of the effects of the interventions. Finally, the participants in this study have a particular linguistic profile: Spanish-Catalan bilingual speakers, with clear dominance of Spanish, but in an environment in which the school language is Catalan. It is possible that the findings reported here are not generalizable to other contexts.

Acknowledgements. This research was carried out with partial support from the project *Ara, l'escriptura! Millorar l'expressió escrita per garantir l'equitat de l'alumnat* (ref. 2015ACUP 00175; I.P. Naymé Salas). The authors are immensely grateful to the teaching staff and first-year students of the 2018-2019 academic year at IES Santa Eulàlia, de l'Hospitalet de Llobregat de Barcelona. We would also like to offer our gratitude to Alondra Camus and Lucía Redondo for their help with coding a part of the data.

The original paper was received on January 15th, 2021
The reviewed paper was received on July 17th, 2021
The paper was accepted on July 22nd, 2021

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