ARGUMENTIVE WRITING AS A COLLABORATIVE ACTIVITY

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ABSTRACT

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Although converging evidence indicates that argumentive thinking and writing are best promoted by collaboration with others, it is still unclear which instructional approaches exert most benefits. The present study builds on the success of using a dialogic approach to develop argumentation skills in middle school students. The key component of the approach used here is the creation of an adversarial classroom setting in which students engage deeply in dialogic argumentation, which is viewed here as a process involving two or more individuals who hold opposing views. In dialogic argumentation, the focus of students’ attention will tend to center on the discursive goals of strengthening their own positions and weakening the position of the opponents. These goals of discourse ensure that students not only exercise supporting their claims with reasons and evidence but also practice making and responding to critiques, which is said to promote students’ mastery of the argument-counterargument-rebuttal structure. While the literature describes compelling advantages of dialogic approaches, it also reports valid concerns. A main concern is that during dialogic argumentation arguers have diverging goals of advancing their own positions, which may prevent the integration of opposing arguments. In an attempt to explore whether this disadvantage can be minimized, the present study examines whether the addition of a collaborative writing activity, as a form of peer argumentation that draws students’ attention towards a converging goal, to the dialogic curriculum provides students a further degree of support in developing their argumentive writing skills. It is hypothesized that collaborative writing would serve as a bridge between dialogic and individual argumentation by changing the
focus of students’ attention from the adversarial to the collaborative dimensions of argumentation. To examine this hypothesis, two classes of sixth grade students participated in a month-long intervention that promoted deep engagement in dialogic argumentation on a series of challenging topics. Groups differed only with respect to participation in collaborative writing. Analysis of individual essays on the final intervention topic indicates that students who participated in collaborative writing showed gains relative to students who didn’t in coordinating evidence with claims, specifically in drawing on evidence to make claims that are inconsistent as well as consistent with their favored positions. On a transfer topic, students in the collaborative writing condition continued to surpass students in the individual writing condition; however, the gains were restricted to drawing on evidence to make claims that are consistent with the students’ favored positions. The results support the claim that the combination of adversarial and collaborative forms of peer argumentation in classroom instruction is a promising path for developing middle school students’ argumentive writing skills. Theoretical and practical implications are discussed.
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CHAPTER 1
INTRODUCTION AND LITERATURE REVIEW

Over 30 years ago, Billig (1987) advanced the idea that inner thinking exhibits characteristics of argumentive discourse. Since then, there is widespread agreement among theorists in psychology (Kuhn, 2005), education (Duschl & Osborne, 2002) and philosophy (Mercier, 2016) that argumentation plays a central role in reasoning. The fact that argumentation is paramount to cognition does not imply, however, that most people are proficient in argumentive competence, either silent, spoken or written. Much research has reported that the process of thinking and constructing ideas as a rational argument poses challenges to people of all ages (Asterhan & Schwarz, 2016; Sandoval & Millwood, 2005). The disparity between argumentation as both a cognitive necessity and a challenge begs the question of how argumentive competence can be developed in the context of education.

Before discussing instructional practices relevant to argumentation, it is important to define argumentive competence, as the literature is not consistent with regard to what constitutes the competences argumentation entails (Rapanta, Garcia-Mila & Gilabert, 2013). The most compelling definitions of argumentive competence, I argue, would not be restricted to cognitive dimensions, such as the acquisition of declarative and procedural knowledge. There is increasing evidence to believe that argumentation entails social (Ryu & Sandoval, 2012; 2015), metacognitive (Zillmer & Kuhn, 2018; Leitão, 2000) and epistemological (Iordanou, 2016; Kuhn, Zillmer, Zavala & Crowell, 2013) dimensions. There is also initial indication that argumentive competence involves individuals’ agency and disposition to engage in discussion.
Inclusive definitions would, therefore, consider the multifaceted characteristics of argumentative competence.

The focus here is on how individual argumentative competence, viewed as entailing both procedural skills and meta-level understanding of argument’s goal, is best promoted by collaboration with others. This focus is consistent with the sociocultural approach and the notion that cognitive processes appear first in the social (inter-mental) plane before emerging as an individual (intra-mental) process (Vygotsky, 1978; Rowe & Wertsch, 2004). It is also consistent with Walton’s (1989; 2010) notion that argumentation is both a social process and an individual product. According to Walton (1989; 2010), argumentation entails the use of the same strategies, such as the need to address the opponent’s view, in both social and individual forms. The main difference between them is that the discursive strategies relevant to argumentation appear in more explicit form in argumentation as a social process. With this rationale, practice in arguing with others is assumed to be the best pathway to skilled individual argumentative competence.

In fact, many empirical efforts have been made to confirm the close connection between social and cognitive factors in the development of argumentative competence. Overall, the literature corroborates that individual argumentative competence is enhanced after engagement in socio-discursive interaction (Resnick, Asterhan & Clarke, 2015), whether in the form of whole-class discussion (Reznitskaya & Gregory, 2013), dyadic interaction (Hemberger, Kuhn, Matos & Shi, 2017) or small-group work (Sun, Anderson, Perry & Lin, 2017).

The literature is less consistent, however, with regard to how educators should promote socio-discursive interaction in their classrooms. An instructional approach that has been proven effective concerns the creation of an adversarial classroom setting in which students engage in dialogic peer argumentation. In dialogic argumentation, referred here as a process that involves
two or more individuals who hold opposing views (Walton, 1989; Kuhn, 1992), students’ attention is drawn to the discursive goals of strengthening their own positions and weakening the position of the opponent. These goals of discourse ensure that students not only exercise supporting their claims with reasons and evidence but also practice making and responding to counterarguments. While the literature describes compelling advantages of dialogic approaches, it also reports valid concerns. A main concern is that during dialogic argumentation students have diverging goals of advancing their own positions, which is said to prevent the integration of opposing arguments. A competing approach concerns the creation of a collaborative classroom setting in which it is assumed that students’ engagement in argument can function from agreement. The classroom activities, instead of drawing students’ attention to the strengths and weaknesses of opposing views, promote students’ engagement in discussion on how to solve a challenging problem or task.

The centrality of dialogic and collaborative instructional approaches in argument instruction reflects the existence of competing hypotheses with regard to the socio-discursive mechanisms that enable development. Specifically, the literature points to two competing hypotheses, i.e. the extent to which agreeing or disagreeing argumentive discourse promotes the richest social context for argument skill development.

Instead of arguing for one or the other, the present work examines whether combining an activity that draws students’ attention towards a converging goal with a dialogic curriculum can achieve greater effectiveness. Specifically, I ask whether the addition of a collaborative writing activity to an argument curriculum that promotes an adversarial classroom setting is a further contributor to the development of individual argumentive competence.
The present work first reviews the literature with the goal of arguing that combining adversarial and collaborative forms of argumentation is a productive developmental path. In this review, I specifically focus on peer argumentation, e.g. dyadic or small-group discursive interaction, as a means to improve individual competence in argumentative writing. The review begins with an explanation of the rationale for employing peer argumentation, with special attention to dialogs, as a means to develop students’ individual writing competence. I then consider advantages and disadvantages described in research of basing argument instruction on adversarial and collaborative forms of peer argumentation. Finally, a theoretical case is made that these two forms of peer argumentation should be reconciled in argument instruction.

Developing Argumentive Writing Through Peer Argumentation

Despite the fact that there are different ways to engage in argumentation, including arguing with oneself and with others, all forms of engagement in argumentation are understood as social activities (Walton, 1989; van Eemeren et al., 1996). This is because of the fact that argumentation consists in the reasoned examination of the acceptability of alternative views, even when these are present in more implicit form (e.g., written argument). The competence to write well-developed essays entails, therefore, acknowledging and considering strengths and weaknesses of alternative views. This is proven to be an arduous task for most people (Stanovich & West, 2007; Felton, 2004; Sandoval & Millwood, 2005). In particular, individuals, especially novice arguers, tend to suppress alternative perspectives in written arguments, phenomenon commonly referred to as myside bias (Wolfe, 2012; Wolfe, Britt & Butler, 2009).

Counterintuitively, the predominance of statements that serve to support one’s own perspective in essays (one-sided reasoning) is not only observed when individuals are arguing for
their favored position. Wolfe and Britt (2008) found that *myside bias* in argumentive essays persists even when individuals are assigned to write for a position that is not aligned with their beliefs. That is, participants in their study tended to make claims that predominantly served to support the side they were assigned to argue, regardless of preference. This result suggests that something else rather than blind preference, as a strictly cognitive factor, accounts for the *myside bias* phenomenon. It is possible that the characteristics of the writing context, specifically the fact that the opposing view is not directly expressed, make the activity of writing arguments that address the alternative position (two-sided reasoning) cognitively demanding for most individuals. Indeed, studies using counter-balanced experimental designs support this rationale (Macagno, 2016), indicating that individuals are more prone to acknowledge and address the alternative position in peer dialogs, rather than in written arguments. Argumentive contexts, thus, impact individuals’ argumentive ability and, moreover, a dialogic context appears to facilitate drawing individuals’ attention to the other side’s arguments.

The main rationale for employing peer argumentation as a means to develop students’ individual argumentive writing skills lies, therefore, in the explicit elaboration and juxtaposition of views. This is especially prominent in the context of dialogic argumentation, as it promotes engagement in the explicit difference in opinion within a connected sequence of speech acts (Walton, Reed & Macagno, 2008). Given its characteristics, dialogic argumentation encourages participants to attend to the discursive goals of supporting and defending own view, and weakening the opponent’s argument (Walton, Reed & Macagno, 2008). To accomplish these goals, arguers center on making use of core strategies, such as making counterarguments and rebuttals. These core strategies, nevertheless, underlie the use of further strategies, such as making direct counterarguments to the opposing position and searching for an alternative
position that could be mutually accepted (Mayweg-Paus, Macagno & Kuhn, 2016). Dialogs, therefore, encompass the use of multiple strategies that can serve different discursive goals, e.g. seeking consensus and identifying flaws in arguments (Macagno & Bigi, 2017).

In fact, previous studies have demonstrated that engagement in dialogic argumentation can promote enhanced two-sided reasoning in dialogic (Felton, Garcia-Mila, Villaroel & Gilabert; 2015; Paphthomas & Kuhn, 2017), as well as in individual argumentation (Iordanou & Constantinou, 2015; Gillies & Khan, 2009; Felton, 2004; Kuhn, Shaw & Felton, 1997). Specifically, after engagement in dialogic argumentation individuals consistently show enhanced competence in acknowledging the alternative position by countering it. This progress has more promptly been reported in topics and domains that students had the opportunity to deeply engage with (Hemberger et al., 2017), but there is also preliminary evidence that this enhanced competence can be transferred across topics and domains (Iordanou, 2010; Kuhn & Crowell, 2011; Reznitskaya et al., 2012; Nussbaum & Asterhan, 2016). Given that the same results were not obtained with other forms of instruction based on peer-to-peer interaction, such as brainstorming (Nemeth et al., 2004) and poster preparation (Iordanou & Constantinou, 2015), it can be hypothesized that dialogic argumentation is effective in argument skill development because it consists in a social process that promote engagement in the most elementary skills of argument (Billig, 1987; Kuhn, 1991).

With this rationale in mind, dialog-based activities have been developed for use in elementary, secondary and college education (Michaels, O’Connor & Resnick, 2008; Ryu & Sandoval, 2012; Iordanou & Constantinou, 2015; Kuhn, Hemberger & Khait, 2016a). The dialogic approach developed by Kuhn and colleagues for middle schoolers focus on learning to argue, as opposed to instruction focused on arguing to learn a specific content knowledge. This
approach has consistently shown effectiveness in enhancing students’ argumentive writing competence, such as in strengthening students’ use of claims that address weaknesses in the opposing position (Kuhn & Crowell, 2011; Hemberger et al., 2017), as well as in improving their meta-level understanding of the goals of argumentation (Kuhn et al., 2013; Kuhn et al., 2008).

According to Kuhn et al. (2016b), students’ trajectory of development is revealed through changes in four core functions that argumentive statements can serve (Figure 1). Support-my statements (upper left box in Fig. 1), which serve to support one’s own position, tend to prevail over the other three functions in students’ essays. The predominance of support-my statements is consistent with studies reporting the need to overcome my-side bias in written arguments (Felton, 2004; Stanovich & West, 2007). With sustained engagement with challenging topics, both dialogically and in writing, Kuhn et al. (2016b) report that novice arguers begin to include weaken-other statements in their essays, as a move serving to critique and thereby weaken the opponent’s position (lower right box in Fig. 1).

Figure 1
Four core argumentive functions
In fact, after only one topic sequence (13 class sessions), almost all students (92%) in Kuhn’s et al. (2016b) study included this type of claim in their final topic essays. This result is relevant since it weaken-other statements were previously absent in students’ pretest essays on unstudied topics (Kuhn & Crowell, 2011). As represented by the diagonal connecting line in Figure 1, support-my and weaken-other statements are consistent. They work together to serve a dual argumentive strategy: “Here’s everything good about my position and bad about yours.”

Increases in the remaining two functions, support-other and weaken-my, are much harder to accomplish since these are inconsistent with the students’ favored position and need to be reconciled with it. Kuhn et al. (2016b) found that statements that identified weaknesses in one’s own position remained negligible in students’ final topic essays even after two years of dialogic engagement. Progress was observed, however, in statements that identify strengths in an opposing position, with 95% of students making support-other statements at least once in final topic essays by the end of the two-year intervention. The appearance of support-other statements in students’ essays requires the connection and integration of opposing arguments, reflected in a “however” clause (“That’s true; however...”). If two statements (e.g., support-other and weaken-other) are not explicitly connected to one another in essays, there is no indication that students are aware that inconsistent statements need to be reconciled to make a coherent argument.

The need to include inconsistent statements is not only justified by idealized models of argumentation, e.g. Toulmin’s model (1958), but also by the reader’s perception of how reliable a written argument is. According to Wolfe, Britt and Butler (2009), most college students in their investigation found a written argument more convincing and reliable when the author addressed inconsistent statements, rather than avoided them. With evidence that even after year-long engagement in dialogic argumentation middle schoolers avoid statements inconsistent with their
favored position in their written arguments (Kuhn & Moore, 2015), some scholars have advanced the hypothesis that it may be counterproductive to put the focus of instruction on adversarial forms of peer argumentation (Villarroel, Felton & Garcia-Mila, 2016; Felton, Crowell & Liu, 2015; Felton et al., 2015; Garcia-Mila et al., 2013; Gilabert, Garcia-Mila & Felton, 2013; Felton, Garcia-Mila & Gilabert, 2009; Asterhan & Babichenko, 2015; Asterhan & Hever, 2015). Building on this research, I now turn to consider two forms of peer argumentation, i.e. adversarial and collaborative, that are supported by dialogic and collaborative instructional approaches, respectively.

**Instructional Approaches Supporting Peer Argumentation**

Converging evidence indicates that individuals adapt their use of strategies according to the goals of the argumentative context (Domberg, Köymen & Tomasello, 2018; Felton et al., 2015; Midgette, Haria & MacArthur, 2007; Felton & Kuhn, 2001; Keefer, Zeitz, & Resnick, 2000). The focus here is restricted to the a priori goals set by educators when designing instruction and promoting peer argumentation in their classrooms, rather than the goals that can emerge during the actual discourse students engage in. In the following subsections, I will describe how dialogic and collaborative instructional approaches are operationalized through promoting adversarial and collaborative forms of peer argumentation in the classroom. Of special interest here is the review of how these forms moderate the effect of peer argumentation on the development of individual writing competence.

**Adversarial Forms of Peer Argumentation.** The adversarial form of peer argumentation is characterized by focus on persuasion goals, which comprises arguing with the intention to defend
a conclusion (Walton, 1989; 2010). Setting the focus of instruction on persuasion means that two main discursive objectives will gain prominence in the classroom. That is, the focus of students’ attention will tend to center on strengthening his or her own position and weakening the position of the opponent (Mayweg-Paus et al., 2016). To be consistent with these goals, instruction must include activities that allow alternative positions on a topic to be directly challenged. An example of instruction broadly representative of the adversarial form is the oral debate.

The rationale for using adversarial forms of peer argumentation in the classroom may be in part justified by the fact that persuading an audience of the acceptability of a position is the traditional goal of argumentation (Rapanta & Macagno, 2016). But, more importantly, the use of adversarial forms is justified by the goals of persuasion, especially the discursive objective of weakening the position of the opponent, which ensures that students are exposed to oppositional discourse and critique. Engagement in discourse that includes critique would strikingly differentiate this form of discourse from the discourse entailed in instruction based mainly on teacher’s discourse and on explanation (Henderson, MacPherson, Osborne & Wild, 2015). Furthermore, exposure to oppositional discourse is said to promote students’ mastery of the argument-counterargument-rebuttal structure, a milestone in the development of argumentive competence (Kuhn et al., 2013).

While the literature describes compelling advantages of adversarial forms of peer argumentation, it also reports valid concerns. The main disadvantage of putting the focus of instruction on persuasion seems to be the undesired accentuation of competition. Given that in adversarial forms of peer argumentation arguers have diverging goals of advancing their own positions, it may be that students will engage in a high frequency of competitive discourse (Asterhan, Butler & Schwarz, 2010) and use discursive strategies that foreclose the exchange of
ideas (Felton et al., 2015). The focus on persuasion can, therefore, accentuate students’ perception of argument as a dispute, rather than an evaluation, of ideas and hinder their participation in authentic argumentive reasoning. This concern has solid foundations since previous studies have already demonstrated that people who perceive argument as dispute tend to avoid engaging in discussion with peers (Kuhn, Wang & Li, 2011).

However, the perception of argument as a dispute may entail not only instructional goals but also epistemological understanding (Sampson & Clark, 2011; Kuhn, Wang & Li, 2011; Zavala & Kuhn, 2017). For instance, even outside the scope of adversarial argumentation and in a collaborative classroom setting, students in Sampson and Clark’s (2011) investigation perceived discussion as either an evaluation of competing ideas or a dispute between right and wrong answers. This result suggests that, whether in the context of adversarial argumentation or not, there is a need to develop students’ understanding of argument as inference to the best (or more acceptable) conclusion. The act of leaving behind the understanding of argument as a dispute between right and wrong answers seems, therefore, to transcend contextual influences. Nevertheless, the literature reports that establishing norms of discourse in the classroom is a productive path to overcoming contextual influences over students’ emphasis on dispute (Mercer, 2000; Michaels, O’Connor & Resnick, 2008).

**Collaborative Forms of Peer Argumentation.** The collaborative form of peer argumentation is characterized by focus on deliberation, which comprises arguing with the intention to arrive at a conclusion (Walton, 1989; 2010). Setting the focus of instruction on deliberation means that the main discursive objective will be to bring together (or coalesce) two or more positions into a consensual decision (Gilbert, 1997; Felton et al., 2009). To be consistent
with this goal, instruction must include activities that require students to agree on a specific choice or solution. An example of instruction representative of the collaborative form is joint problem solving.

This idea that argumentation can function from agreement and that arguers can work together with the joint goal of finding out the best solution to a controversy has its philosophical roots in Gilbert (1997). This theoretical assumption is confirmed by empirical studies that show agreeing argumentive discourse can be fully strategic (Felton & Kuhn, 2001). For instance, collaborative forms of argumentive discourse may be fully strategic in articulating, supporting and enriching a position (Keefer, Zeitz & Resnick, 2000). Furthermore, this form of discourse may elicit authentic collaboration between students in terms of likelihood that students will elaborate and integrate their partner’s arguments (Felton et al., 2015).

In this sense, collaborative forms of peer argumentation, although mitigating attention to core argumentive strategies such as counterarguments and rebuttals (Mayweg-Paus et al., 2016), have important advantages. For instance, Asterhan and Schwarz (2016) argue that the focus of instruction on deliberation and collaboration, rather than on persuasion and dispute, is a preferable educational goal because it reflects desired social norms, such as listening to everyone’s opinion. The rationale for using collaborative forms of dialogic argumentation in the classroom is justified, therefore, by its potential to reduce dispute between arguers and increase cooperation. As mentioned, this is a valid concern since negative effects of engagement in persuasion have been reported in the literature (Budesheim & Lundquist, 2000; Asterhan, Butler & Schwarz, 2010; De Conti, 2013).

Yet, by drawing students’ attention to the collaborative dimension of argumentation, instruction under deliberative goals runs the risk of yielding less than ideal exposure to
oppositional discourse and critique. This is especially problematic because the literature reports that people tend to avoid making opposing remarks (Andriessen et al., 2003), although criticizing ideas and answering to criticisms are assumed to be the most relevant aspects for belief revision (Henderson et al., 2015; Duschl & Osborne, 2002) and metacognitive reflection (Kuhn, 2015; Leitão, 2000). Furthermore, it seems more difficult for students to offer a critique to an argument than to offer an alternative solution (Henderson et al., 2015). In Osborne et al.’s (2013) large-scale study, for example, only 15% of high school students directly countered a flawed argument, a contrast to the most frequently used strategy of countering by advancing an alternative position. Results such as this indicate that there is a need to first develop students’ competence in making effective counterarguments before they can effectively engage in more advanced strategic moves entailed in collaborative forms of peer argumentation.

Reconciling Adversarial and Collaborative Forms of Argumentation

Instead of advocating for the use of adversarial or collaborative forms in argument instruction, my approach is based on the notion that students will benefit from engaging in both forms of peer argumentation. This assumption is supported not only by the sociocultural approach (Vygotsky, 1978; Rowe & Wertsch, 2004) but also by the philosophical premise that argumentation has at the same time collaborative and adversarial dimensions (Mercier et al., 2017). From the Vygotskian notion that cognitive processes appear first in the inter-mental plane before emerging as an intra-mental process, I advance the hypothesis that the benefits of engagement in peer argumentation are not restricted to disagreement and that different forms of peer discursive interaction can promote the competences important to individual argumentative writing. Furthermore, from the philosophical notion that argumentation has complex and
contradictory dimensions, I contend that argument instruction would exert most benefits when reflecting both of these dimensions.

In addition to theoretical grounds, the notion that both forms of discourse are relevant in classroom practice is supported by empirical investigations. The most compelling evidence is based on the comparison between individuals who were either instructed to argue with the goal to persuade or to reach consensus in dialogs (Villarroel, Felton & Garcia-Mila, 2016; Felton, Crowell & Liu, 2015; Felton et al., 2015; Garcia-Mila et al., 2013; Felton, Garcia-Mila & Gilabert, 2009). In this series of investigations, individuals (e.g., teens, college students or pre-service teachers) were assigned to participate in dialogs with opposing-side partners. The results invariably point to effectiveness of the goal of reaching consensus, relative to the goal of persuading. For instance, Felton, Crowell and Liu (2015) reported that college students in the consensus condition made significantly more claims inconsistent with their favored position in essays, compared to college students in the persuasion condition. Findings from these studies suggest that in the context of dialogic argumentation (adversarial form), the instruction to reach consensus (students’ attention is drawn to a converging goal) produced better outcomes, relative to the instruction to persuade (students’ attention is drawn to diverging goals). The claim I make here is that the success of the instruction to reach consensus in an adversarial setting showcases that combining adversarial and collaborative forms of peer argumentation can achieve greater effectiveness.

Some initial efforts in this direction have been proposed. For instance, Leitão and colleagues (Leitão, 2012; Leitão et al., 2012) developed an argument curriculum for undergraduate psychology students based on the integration of debate activities and deliberative instructional goals (inspired by a model created by Fuentes, 2011). Specifically, Leitão (2012)
uses debate as a teaching resource based on the assumption that this activity offers students the opportunity to deeply engage in the essential discursive moves entailed in argumentation, i.e. supporting one’s own claims and responding to other’s critiques. After engagement in debate, students’ attention is drawn to deliberative goals. In particular, students engage in the formulation of criteria that can serve as basis for evaluating the arguments produced during the debate and reaching a consensual solution to the issue being addressed. Preliminary analysis indicate the Leitão’s curriculum is effective in developing students’ argumentive competence, in particular in enhancing students’ ability to integrate belief-inconsistent (support-other and weaken-my) with belief-consistent (support-my and weaken-other) arguments in essays.

It can be hypothesized, therefore, that approaches that reconcile adversarial and collaborative instructional goals have the potential to enhance students’ argument competence to higher levels. On one hand, the adversarial forms of argumentation would ensure students’ exposure to disagreement and critique, promoting engagement in use of counter and rebuttal strategies. On the other, the collaborative forms of argumentation would minimize dispute and polarization, promoting more elaboration and integration of ideas. I now turn to discuss how the present study will examine this hypothesis.

The Present Study

The present study builds on the success of using a dialogic curriculum to develop argumentation skills in middle school students (Kuhn, Hemberger & Khait, 2016a). The curriculum key components are the creation of an adversarial classroom setting in which students engage deeply with social issues and in extended discourse with peers. The present study explores whether the addition of a collaborative writing activity, as a form of peer argumentation
that draws students' attention towards a converging goal, the argument curriculum provides students a further degree of support in developing their argumentative writing skills.

The main hypothesis advanced here is that the collaborative writing activity will serve as a bridge between dialogic and individual argumentation by changing the focus of students’ attention from the adversarial to the collaborative dimensions of argumentation. Specifically, it is expected that the collaborative writing activity will provide students an opportunity to reflect and negotiate about the writing activity itself, which will in turn enhance their procedural skills and meta-level understanding of argument’s goals.

*Writing as a Collaborative Activity*. The impact of engagement in collaborative writing activities on students’ individual writing performance has been widely reported (Gutiérrez, 2017; Van Steendam 2016; Thompson & Wittek, 2016; Sampson & Clark, 2009; Larkin, 2009; Andriessen et al., 2003). Overall, studies point to benefits of writing in collaboration. For instance, in Sampson and Clark’s (2009) experimental research students who had participated in collaborative writing showed enhanced skill in argumentive writing in a new task, compared to students who worked alone throughout both tasks. Furthermore, studies also indicate that the discourse students engage in during collaborative writing is marked by metacognitive planning and reflection, even for children aged 5-7 (Larkin, 2009).

The respect in which my investigation goes beyond that of previous studies is to propose the examination of collaborative writing in the context of sustained engagement, both dialogically and in writing, with challenging topics. In the context of the present study, if collaborative writing proves effective, there will be converging evidence of argument skills appearing first at the social (inter-mental) level and then transferred to the individual (intra-
mental) level. Furthermore, there will be preliminary evidence that instructional practices that integrate collaborative and adversarial forms of argumentation have the potential to accelerate argument skill development.

Research Questions. To assess the hypothesis that collaborative writing can serve as a bridge between dialogic and individual argumentation, the present study compares two middle school classes who participate in a month-long intervention designed to develop students’ argumentive thinking and writing skills. They differ only regarding engagement in collaborative writing. Three research questions are addressed:

RQ1. Does addition of a collaborative writing activity enhance students’ skill in individual argumentive writing on an intervention topic, relative to the same curriculum minus the collaborative writing component?

RQ1a. Does the collaborative writing group include more evidence-based claims in essays, compared to the individual writing group?

RQ1b. Does the collaborative writing group make more references to claims that are inconsistent with their own position (support-other and weaken-my) in essays, compared to the individual writing group?

RQ1c. Does the collaborative writing group include more counterarguments and rebuttals in essays, compared to the individual writing group?
RQ2. Does addition of a collaborative writing activity increase the chance that gains in argument skill are transferred to new topics and tasks, relative to the same curriculum minus the collaborative writing component?

RQ2a. Does the collaborative writing group show enhanced argumentive writing skills in a transfer topic essay, compared to the individual writing group?

RQ2b. Does the collaborative writing group show greater skill in evaluating counterarguments, compared to the individual writing group?

RQ2c. Does the collaborative writing group show greater meta-level understanding of the goals of using evidence in essays, compared to the individual writing group?

RQ3. If collaborative writing is beneficial, is collaboration with an agreeing or disagreeing partner more effective?
CHAPTER 2

METHOD

Data collected at a Brazilian public secondary school during the first half of the 2017 school year served as the basis for the study.

Participants

The participants were 90 middle school students (44 females) attending a selective public school in a large city in northeastern Brazil. Acceptance to the school was based upon scores on an entrance exam. Until 2016, scores on the entrance exam were the only criteria for admission; however, the school adopted a new admission policy since a survey showed that 99% of students admitted to this school from 2012 to 2014 came from private elementary schools (PPPI, 2015). In 2017, elementary school type was included as an acceptance criterion and half of admissions were reserved for students from public schools.

Two classes of sixth graders participated in the intervention (argument curriculum) and served as the experimental group ($N = 30$) and the comparison group ($N = 30$). Half of the sixth grade students came from public elementary schools and 13% of their families qualified for Social Welfare Programs (low to extremely low socioeconomic status). The mean age of sixth graders was 11 (range from 10 to 12).

One class of seventh graders served as a non-participating control group ($N = 30$) and took part only in a final assessment. The mean age of seventh graders was 12 (range from 11 to 13). The seventh graders came mostly from private elementary schools (99%, as previously mentioned) and only 2% of their families qualified for Social Welfare Programs. The slightly
older age and more affluent SES of the control group work against a demonstration of the overall
effectiveness of the curriculum.

All entering students were assigned randomly to one of two sixth-grade classes by the
school administration at the beginning of the school year. One class was randomly assigned by
the researcher to serve as the experimental condition (quasi-experimental design). Both sixth-
grade classes had an equivalent distribution in terms of gender (50% females) and elementary
school type. The experimental group contained 16 students from public elementary schools, the
comparison group 14 students from public elementary schools. Further data supporting
equivalence appear in Table 1.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Male</th>
<th>From Public Elementary Schools</th>
<th>Mean (and SD) writing score</th>
<th>Mean (and SD) total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>30</td>
<td>15</td>
<td>16</td>
<td>6.77 (2.46)</td>
<td>27.50 (7.43)</td>
</tr>
<tr>
<td>condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
<td>30</td>
<td>15</td>
<td>14</td>
<td>6.27 (2.84)</td>
<td>26.80 (8.83)</td>
</tr>
</tbody>
</table>

The school entrance exam measured literacy skills, such as reading comprehension and
vocabulary; mathematical skills, such as basic numerical operations and geometry; writing skills,
such as text cohesion and coherence. Regarding overall performance on the exam, the
experimental condition had a mean total score of 27.50 (SD = 7.43) and the comparison
condition had a mean total score of 26.80 (SD = 8.83), a nonsignificant difference, $t(58) = 0.33$,
$p = 0.74$.

Of special interest for the present work are the writing scores. To complete this task,
students were provided with a reading about a regional cultural heritage and asked to write a
letter, based on this reading, explaining the importance of preserving such heritage. In other words, students were asked to read a piece of text that would serve as evidence for a specific point of view. Even though the writing scores on the school entrance exam will not directly reflect the argumentive writing skills examined in the present study, it is reasonable to assume, due to the nature of the task, that the writing scores implicate such skills. The experimental condition had a mean writing score of 6.77 (SD = 2.46) and the comparison condition had a mean writing score of 6.27 (SD = 2.84), a nonsignificant difference, t (58) = 0.73, p = 0.47. Thus, there is no reason to believe that the two sixth-grade classes were significantly different prior to the intervention regarding overall academic performance, as well as writing performance.

**Intervention Procedure**

The intervention procedure consisted of an argument curriculum that was implemented during five 50-minute class sessions per week over a period of one month. The argument curriculum implemented followed that described by Kuhn et al. (2016a), with the addition in the experimental group of sessions devoted to joint writing, which served as the manipulation, and the reduction, due to time constraints, of a couple of sessions of pairs’ dialogs.

All sixth-grade students participated in the argument curriculum, which was implemented as a unit of their regular language course. The curriculum was delivered by the researcher, who was introduced to students as a “debate coach”, with the support of the classroom teacher. Since most activities in the curriculum were student-centered, the role of both adults was directed toward facilitating the group process.

Before the start of the intervention, all sixth-grade students were asked to indicate they were either in favor, against or undecided with regard to ten different socio-scientific issues (e.g.,
whether parents should be allowed to homeschool their children). Topics with fairly even splits between “pro” and “con” responses were chosen for the intervention.

The intervention was divided into two cycles. Each cycle consisted of approximately two weeks of work, with a new topic introduced at the beginning of a new cycle. Topic 1 was whether companies should be allowed to conduct medical research involving animals. Topic 2 was whether workers should be required to contribute some of their pay to the government Social Security program or they should be free to save for their own retirement.

Each topic cycle began with small-group team work (Pregame) and proceeded to dialogs between opposing-side pairs (Game). Final small-group preparation (Endgame) preceded a whole-class showdown debate, which was followed by a debrief session and final essay assignment. As detailed in the design section, the manipulation took place during the final essay assignment, when students were either instructed to write individually (comparison condition) or with the collaboration of a classmate (experimental condition).

At the start of the first topic cycle, students were introduced to the argument curriculum. Students were informed that they would be coached to think deeply about controversial topics with the goal of increasing their understanding about these topics. Since debate classes and clubs are an uncommon practice in Brazilian schools, students were introduced to the idea that there are different types of arguments people can engage in and the focus of the curriculum was on promoting intellectual discussions between them. For this to happen, students were told that some ground rules must be followed, such as listening carefully to everyone’s opinion and criticizing ideas, not people. The instructors emphasized these ground rules throughout the intervention.
**Pregame (Sessions 1 and 2).** Students were organized into groups of five students who shared the same position on the topic.

In the first session, the groups received white index cards and each student was instructed to write down on one of these cards a reason for holding their position. The students then collaborated with a classmate seated to their left, who worked on rewording their reason in as few words as possible. The reason cards were then presented to the other students in the group and the students worked together to decide whether there were similar reasons among their cards that should be placed together.

For the first topic only, the second session was preceded by a whole-class discussion about what criteria might make some reasons stronger than others. This discussion culminated in the notion that stronger reasons might be supported by more or better evidence. Students were then invited to submit questions pertaining to the topic, the answers to which they thought might be useful to them in their argumentation. Brief factual answers to student-generated questions were provided at the next session. (For instance, one of the students’ questions during topic 1 was “Are animals used for other reasons than testing medical treatments?” The answer provided was “Animals may be used to test reactions to new cosmetics or other products for the human body”).

In the second session, the small groups continued the work on their own reason cards by considering which of their reasons were the strongest. They did this by categorizing their reason cards into “best”, “good” or “so-so” reasons.

**Game (Sessions 3 and 4).** Students were paired with a same-gender peer who held the same position on the topic.
Over the following two sessions, same-side pairs engaged in a series of written dialogues with opposing-side pairs (conducted by passing a pad back and forth). Each same-side pair met with a new opposing pair for the second game session. Students were instructed to collaborate with one another in constructing their responses to the opposing pair, as well as instructed to respond directly to their opponents’ claims.

The dialogues started with pairs from one side writing their reasons for holding their position in the top box of the first sheet of the pad. Students then passed the pads to the opposing pair, who responded in writing in the box below and then returned it to the first pair to respond. Pairs responded to one another in a continuing cycle. An advantage of the “Pass-the-Pad” method is that it enables students to see a written record of their dialogue, something spoken dialog precludes.

Evidence Q&A. Once the dialogues were underway, pairs were provided with answers to their self-generated evidence questions, as well as with evidence in Q&A format preselected by the researches, with the instruction “Here is some information that might be useful to you”. The pieces of evidence were provided to students in the following sequence: first evidence serving most readily to support their own side, followed by weaken other side, and then support other side and weaken my side. This sequence, which had previously been shown to scaffold students’ skill in using evidence in connection with their claims (Hemberger et al., 2017), insured that “pro” and “con” sides were provided with the same pieces of evidence, although in a different order. For instance, the same piece of evidence was first provided to students supporting the “pro” side, as support-my evidence, and later to students supporting the “con” side, as support-other evidence. This procedure assured that all students had access to the same pieces of
evidence by the end of each topic. Student-generated Q&As were similarly made available to all students.

*Reflections sheets.* Before a dialogue session was concluded, a reflection sheet was distributed to students. In the first dialog session, pairs were asked to complete an “other side” reflection sheet (see Appendix A). This asked pairs to first record their opponent’s main argument and their counterargument, and then to try to construct an improved counterargument. In the second dialog session, pairs were asked to complete an “own side” reflection sheet. It asked pairs to first record their main argument, their opponent’s counterargument to that argument, and the pair’s rebuttal. Pairs were then asked to construct an improved rebuttal to their opponent’s counterargument. This activity encouraged pairs to engage in metacognitive reflection on their own and opponents’ argumentive moves.

*Endgame* (Sessions 5 and 6). Students returned to their same-side small groups to prepare for the whole-class debate.

At session five, students focused on reviewing other side’s arguments and their counterarguments against them. Each group received for their review all “other side” reflection sheets that their side had completed during the dialogue sessions. Students were first asked to group the reflection sheets into piles, one for each “other side” main argument. Summary Reflection Sheets were then distributed and completed to facilitate students’ review of these arguments. Each student worked on a pile and filled out a summary reflection sheet that identified the best counterargument against this argument that their team could use during the final debate. Students then decided together what evidence could be used with their
counterarguments. Notes on yellow post-its were attached to the summary sheets to signal that a piece of evidence could support or weaken a claim.

During the following session, students reviewed their own arguments, expected counterarguments and rebuttals. They received their “own side” reflection sheets this time and were asked to sort their own reasons into piles. A summary sheet facilitated the identification of the other side’s strongest counterargument for each reason, as well as selection of the best rebuttal they had in response to each counterargument. The summary sheets were then reviewed and yellow post-its were used as indicators of evidence that could support or weaken a claim.

**Showdown Debate** (Session 7). In a whole-class culminating activity, succession of students from each side volunteered to verbally debate a classmate from the opposing side. Each round lasted two minutes and during this two-minute period either debater or any of their teammates could call a one-minute Huddle to enable the speaker to receive help from teammates. These verbal exchanges were audio recorded and transcribed for the preparation of an argument map to be used in the following session.

**Showdown Debrief** (Session 8). Students engaged in a coach-facilitated discussion about the argumentative strategies used during the debate. The argument map, a word-by-word transcript of the debate, facilitated this process. Students were guided through the argument map, with points were assigned for effective argument moves (e.g., counterarguments, rebuttals, and evidence use) and subtracted for ineffective moves (e.g., unwarranted assumptions, unsupported claims, and misuse of evidence). A winning side was declared based on these points.
Final Essay Assignment (Sessions 9 and 10). To conclude work on the topic, students wrote a final essay in the form of a position statement written as a newspaper Letter to the Editor. The writing prompt indicated that students should give as full an idea of the issue as possible for someone who hasn’t thought about the topic (See Appendix B). A copy of the complete Q&A-format evidence list for the topic was available for students’ use while writing the essay. Table 2 presents the intervention topics with associated scenarios and examples of evidence Q&A.

Table 2

<table>
<thead>
<tr>
<th>Topic</th>
<th>Scenario</th>
<th>Examples of Evidence Q&amp;A</th>
</tr>
</thead>
</table>
| Animal Research        | In medical research labs across the country animals are used to test new medications. This testing makes it possible to develop new medications that can save human lives. Should companies be allowed to conduct this research upon animals? | Evidence about Animal Research  
Q: How many animals are involved in medical research each year in the USA?  
A: The U.S. Department of Agriculture reports that 1.2 million animals were used in research 2005. This does not include rats and mice, which make up about 90% of animals used in research.  
Evidence about Alternative Methods  
Q: Can synthetic versions of human organs be used in research?  
A: Studies involving the effect of sunscreen on a material like human skin gave quick results, compared to the length of time required for animal testing. |
Social Security

Brazilian workers must pay social security tax. Workers and employers each contribute a percentage of the worker’s pay to fund the program. After workers reach about age 65, it provides them a monthly allowance for the rest of their lives. Some workers are unhappy about how much the tax takes out of their paycheck. Also, there are worries the fund will run out of money because there are now many more older people. Should the social security program continue in its present form? Or should people be able to save for their own retirement?

Evidence about Social Security

**Q:** Is the money that is subtracted from workers’ paychecks kept safe for them until their old age?

**A:** No. The money is used for benefits to today’s older people. When today’s workers are old, new younger workers will contribute the money for benefits to today’s workers.

Evidence about Saving

**Q:** How much do working people save from their incomes?

**A:** There is great variation in savings, even among people with similar lifetime incomes; many people save none of their income and others save a great deal.

Experimental Design

The experimental and comparison groups differed only with respect to engagement in collaborative writing during the final essay assignment. While comparison students were asked to write their final essays individually, experimental students were asked to write their final essays in collaboration with a partner.

The collaborative writing activity differed by topic. For the first intervention topic, experimental students were assigned to write a joint essay in same-side pairs; in the second intervention topic they were assigned to write a joint essay in opposing-side pairs. In both cases, experimental students were instructed to collaborate with the assigned partner (i.e., “Both of you should agree on what goes down on the paper.”). The goal of this variation in pair assignment
was to examine whether there are differences in the nature of the discourse students engage in during these two forms of peer collaboration and whether any such differences influence writing quality (RQ3).

In the second intervention topic, experimental students were also asked to write an individual final essay in the class session that followed the collaborative writing activity. The object of this task was to compare the individual writing performance of students who participated in collaborative writing with those who didn’t on an intervention topic (RQ1). The study design is schematically displayed in Table 3.

Table 3

<table>
<thead>
<tr>
<th>Study Design</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Assessments</strong></td>
</tr>
<tr>
<td><strong>Topic 1</strong></td>
</tr>
<tr>
<td>Experimental (collaborative writing) condition</td>
</tr>
<tr>
<td>Comparison (individual writing) condition</td>
</tr>
<tr>
<td>Non-participating control condition</td>
</tr>
</tbody>
</table>

As depicted in Table 3, comparison students only engaged in individual final essay writing during both intervention topics. Given that I was interested in assessing gains on an intervention topic, the second intervention topic included two class sessions devoted to essay writing. In topic 2, comparison students were first asked to write a Letter to the Editor, and then asked to rewrite their letter, trying to improve it. To assure that the rewrite activity was meaningful to comparison students, they were provided with general feedback on their first
essay. For instance, a note written by the coach would say: “You’re off to a good start. Please build more on your arguments”.

For clarity, the experimental condition will be referred to in the remaining of the text as collaborative writing group and the comparison condition as individual writing group.

During the intervention, the non-participating control group was engaged in their regular language course classes. The 7th grade language curriculum adopted by the school does not include engagement in debate or argumentation.

Post-Intervention Assessment

At a final class session, students in the collaborative writing and in the individual writing conditions were asked to complete three novel tasks: transfer essay, evidence selection and argument choice. The goal of these tasks was to examine whether the addition of the collaborative writing activities to the argument curriculum increase the chance that gains in skill are transferred (RQ2).

The non-participating control group of seventh graders was also asked to complete the post-intervention assessment. Although aware that the non-participating control group is not equivalent to the participating groups, and so a comparison between them is susceptible to internal validity threats, this comparison is important as an attempt to gather evidence for the effectiveness of the argument curriculum in this specific school context.

Transfer essay. Students in all three conditions were asked to write an individual essay on a transfer topic -- whether teens who commit serious crimes should be tried in an adult court system or a juvenile court system. Instructions were identical to those for the intervention topic
final essay assignment. Students were provided a similar list of 11 pieces of Q&A evidence to use in their essays if they wished. Table 4 presents the transfer topic with associated scenario and examples of evidence Q&A.

Table 4

<table>
<thead>
<tr>
<th>Topic</th>
<th>Scenario</th>
<th>Examples of Evidence Q&amp;A</th>
</tr>
</thead>
</table>
| Juvenile Court| Teens who commit serious crimes maybe tried and sentenced in the adult court system. Or they may be tried in a court system for juveniles. Which is better? | Evidence about Juvenile Court

Q: Are punishments for the same crime different in juvenile and adult courts?
A: Yes, punishments tend to be less severe and sentences shorter in juvenile court. In Brazil, sentences in juvenile court can only last up to 3 years.

Evidence about Adult Court

Q: How many murders are committed by teens?
A: According to Unicef, juveniles committed 3% of murders from 2002 to 2012 in Brazil.

Evidence selection. Before writing their essays, students received a written list of four types of evidence they could potentially use when writing the essay:

1. Evidence of good results that come from being tried in adult court
2. Evidence of good results that come from being tried in juvenile court
3. Evidence of bad results that come from being tried in adult court
4. Evidence of bad results that come from being tried in juvenile court
The written instructions asked students to circle the type of evidence they would most like to see before writing the essay. They were then asked to circle the type they would second most like to see. The goal of this task was to assess students’ meta-level awareness of what type of evidence would be most important in their essays.

*Argument choice.* After completing their essays, students were provided with a written task comprising seven items. For each item, students were introduced to an argument about the topic of why students fail in school. Students were then instructed to choose from the two options the response an expert arguer would make to the previous argument. The goal of this task was to examine students’ skill in recognizing the more effective counterargument, i.e., the one that directly addresses and seeks to weaken the opponent’s claim. A sample item for this task appears below:

*Chris says: “Students fail in school because they don’t try hard enough to do well on tests.”*

**Does Jose say A or B in response to Chris?**

A. “No matter how hard students work, some just aren’t good test-takers.”

B. “Some students act out in class instead of paying attention to the teacher.”
Coding of essays

Each essay was first segmented into idea units, with an idea unit defined as a claim together with any reason and/or evidence supporting it. Examples of idea unit for the animal research topic were “I think we shouldn’t test on animals because they will suffer” (Claim + Reason) and “I think we should test on animals because they have the same diseases that we have, like cancer” (Claim + Evidence).

Each unit was first assigned into evidence-based or non-evidence-based categories, with evidence considered as any factual information that was provided to students in the Q&A-format evidence list (shared evidence) or that was drawn from their own knowledge or experience (personal evidence). Shared evidence was more prevalent in intervention and transfer essays, compared to personal evidence. The evidence-based statement showed in the previous paragraph includes a shared evidence. Personal evidence appeared more frequently in the transfer essays, as students weren’t asked to generate their own evidence questions. An example of idea unit with personal evidence was “Tests wouldn’t put species in danger. Rats reproduce fast and have many babies”.

The next step was assigning each unit into functional and non-functional categories. A unit was coded as functional when it was successfully employed in service of a claim. All examples previously mentioned were coded as functional. If a connection between unit and claim was missing, the unit was coded as non-functional. An example of non-functional statement was
“Government and citizens have talked a lot about animal research” (Not clear which claim is supported by this statement).

The evidence and functional categories resulted in the following four mutually exclusive and exhaustive classifications: functional evidence-based statements, functional non-evidence-based statements, non-functional evidence-based statements, and non-functional non-evidence-based statements. Functional statements (evidence-based and non-evidence-based) were further classified into one of four subtypes based on their specific function: support my side, weaken other side, support other side, and weaken my side. Table 5 provides definitions and examples of the four subtypes of functional statements.

Two coders randomly chose 20% percent of the dataset (43 essays) and independently segmented them into idea units, achieving an inter-rater agreement of 91%. Having resolved disagreements in segmentation through discussion, the coders proceeded with assigning each unit into one of the ten categories (four functional non-evidence-based categories, four functional evidence-based categories, non-functional non-evidence-based category, non-functional evidence-based category), achieving an agreement of 85% (Cohen’s kappa = 0.78, p < .001). Disagreements were settled through discussion and the author coded the remaining essays blind to condition.

Table 5

<table>
<thead>
<tr>
<th>Subtypes</th>
<th>Definitions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support my side</td>
<td>A statement serving to functionally support one’s own position.</td>
<td>“Testing upon animals is better because we can be sure that the medicine will work or not.” (Pro Side)</td>
</tr>
</tbody>
</table>
“Scientist can use technology to make new medicines for humans. So why use animals for creating new medicines if we have modern day technology?” (Con Side)

Weaken other side
A statement serving to functionally critique and thereby weakens the opponent’s position.

“Technology does not work 100%.” (Pro Side)

“Animal testing costs more because they use many animals and need to keep them in a controlled place.” (Con Side)

Support other side
A statement serving to functionally acknowledge strengths of the opponent’s position.

“I agree with the other side that we should reduce the number of animals used in research (100 million).” (Pro Side)

“It’s true that there are laws to protect the animals from harm.” (Con Side)

Weaken my side
A statement serving to functionally acknowledge weaknesses of one’s own position.

“But taking another perspective I agree that animals will feel pain.” (Pro Side)

“But I know that the alternative methods are not commonly used yet.” (Con side)

**Production of Arguments**

I report here on the individual essays students wrote on an intervention and a new transfer topic. As outlined in Table 6, the analysis reported in this subsection addresses learning and transfer gains observed in students’ individual essays. As later described, conditions differ in the ability to produce written arguments. A case will be made that the addition of the collaborative writing activity enhanced students’ writing skills in a way consistent with developmental gains that are a result of engagement in dialogic argumentation (Kuhn, Hemberger & Khait, 2016b).
Table 6

Operationalization of Production of Arguments Research Questions

<table>
<thead>
<tr>
<th>Research Question</th>
<th>How the RQ was addressed</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Gains</strong></td>
<td>Comparison between the collaborative writing and the individual writing groups on the final intervention topic individual essays.</td>
<td>Number of:</td>
</tr>
<tr>
<td>Does the addition of a collaborative writing activity enhance students’ skill in individual argumentive writing on an intervention topic, relative to the same curriculum minus the collaborative writing component?</td>
<td></td>
<td>- Idea Units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Functional Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Evidence-Based Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Belief-Consistent Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Belief-Inconsistent Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- However Clauses</td>
</tr>
<tr>
<td><strong>Transfer Gains</strong></td>
<td>Comparison between the writing performance of the collaborative writing and the individual writing groups on the transfer topic individual essays.</td>
<td>Number of:</td>
</tr>
<tr>
<td>Does the addition of a collaborative writing activity produce gains in argumentive writing skill that transfer to writing on new topics?</td>
<td></td>
<td>- Idea Units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Functional Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Evidence-Based Statements</td>
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<td>- Belief-Consistent Statements</td>
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<tr>
<td></td>
<td></td>
<td>- Belief-Inconsistent Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- However Clauses</td>
</tr>
</tbody>
</table>

**Individual Essays on an Intervention Topic**

I first examine whether the addition of a collaborative writing activity enhances students’ subsequent essay writing performance on the second and last intervention topic, compared to the same curriculum minus the collaborative writing component (RQ1), after both groups had engaged with the topic for approximately 10 hours in the various activities described earlier.

The first variable considered is length of the essays. Length is measured by the total number of idea units an essay contains. The mean number of idea units was 9.69 ($SD = 4.12$) for the collaborative writing condition and 7.00 ($SD = 2.45$) for the individual writing condition. A
Generalized Linear Model (GLM)\(^1\) with the Poisson distribution indicated the intervention essays written by students in the collaborative writing group was 1.384 times the length of essays written by students in the individual writing group, a significant difference, Wald \(X^2\) adj \((1, N = 58) = 9.539, p = .002\). Thus, the addition of a collaborative writing activity increased the number of idea units generated by students in their individual essays.

Where does this overall difference between essays in the two conditions lie? First, I examine whether the idea units were used functionally and included evidence (Table 7). Essays of both groups consisted mainly of functional evidence-based statements, which accounted for 68% and 60% of statements written by collaborative writing and individual writing groups, respectively. The mean number of functional evidence-based statements was 6.62 \((SD = 3.11)\) for the collaborative writing condition and 4.21 \((SD = 2.30)\) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the use of functional evidence-based statements by students who participated in collaborative writing was 1.574 times the use of functional evidence-based statements by those who didn’t, a significant difference, Wald \(X^2\) adj \((1, N = 58) = 15.340, p < .001\). There was no statistically significant difference across conditions in the three remaining variables (functional non-evidence-based, non-functional evidence-based statements, and non-functional non-evidence-based statements). Thus, the addition of a collaborative writing component produced not only quantitative but also qualitative gains in the use of more advanced types of essay components.

\(^1\) Data violated the assumption of equidispersion. To account for overdispersed distributions, standard errors and test statistics were adjusted for all GLM tests.
Table 7

Mean (and SD) Number of Functional and Evidence Statements by Condition for the Intervention Topic

<table>
<thead>
<tr>
<th></th>
<th>Collaborative Writing Condition (n = 29)</th>
<th>Individual Writing Condition (n = 29)</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based*</td>
<td>6.62 (3.11)</td>
<td>4.21 (2.30)</td>
<td>1.574</td>
</tr>
<tr>
<td>Non-evidence-based</td>
<td>1.45 (1.43)</td>
<td>1.62 (1.29)</td>
<td>0.894</td>
</tr>
<tr>
<td><strong>Non-functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based</td>
<td>0.31 (0.66)</td>
<td>0.14 (0.58)</td>
<td>2.250</td>
</tr>
<tr>
<td>Non-evidence-based</td>
<td>1.31 (1.67)</td>
<td>1.03 (1.57)</td>
<td>1.267</td>
</tr>
</tbody>
</table>

*To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for \( p < .0125 \).

Given the conditions differed in the use of functional evidence-based statements, these can be examined further with respect to the four functional subtypes of claims (support-my, weaken-other, support-other, and weaken-my). Figure 2 shows a clear pattern of frequency of use of the four subtypes of functional evidence-based claims for both groups. That is, statements that support students’ own position appear most readily, followed by statements that weaken the opponent’s position. Adding statements that support the opponent’s position appears more challenging and is less frequent, although more so than the apparently most challenging statements, those that weaken students’ own position. From visual inspection, it is possible to infer the addition of collaborative writing activities enhanced students’ writing skills for all four functional subtypes. To examine whether there were statistically significant differences across conditions, the functional subtypes were combined into belief-consistent (i.e., support-my and weaken-other) and belief-inconsistent (i.e., support-other and weaken-my) evidence-based statements.
Belief-Consistent Evidence-Based Statements. Compatible with previous findings (Hemberger et al., 2017), belief-consistent evidence-based statements appeared most readily for both groups. The mean use of belief-consistent evidence-based statements was 4.14 (SD = 2.41) for the collaborative writing condition and 3.00 (SD = 2.19) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the use of belief-consistent evidence-based statements by students who participated in collaborative writing was 1.471 times the use of belief-consistent evidence-based statements by those who didn’t, a significant difference, Wald X² adj (1, N = 58) = 5.299, p = .021 (To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for p < .025).

Before moving to consider differences between conditions in the mean use of belief-inconsistent evidence-based statements, I examine here what proportion of students ever made belief-consistent evidence-based statements in the intervention topic. The aim here is assessing to what extent the addition of the collaborative writing activity benefited all students versus only a more able few responsible for the increased use of statements. The proportion of students who ever used belief-consistent evidence-based statements in the intervention topic essay was 100% for the collaborative writing condition and 83% for the individual writing condition, a significant difference as assessed by Fisher’s Exact Test² (p = .026). Thus, even though the majority of students in both groups were able to draw on evidence to make belief-consistent statements, the addition of the collaborative writing activity significantly enhanced such ability for all students.

² A Fisher’s Exact Test was used in those cases when the expected frequency was less than five. Otherwise, a Chi-square test was used.
Belief-Inconsistent Evidence-Based Statements. Compared with previous findings (Shi, Matos & Kuhn, in press) showing negligible use of belief-inconsistent evidence-based statements even after a yearlong intervention, both collaborative writing and individual writing conditions made support-other and weaken-my statements at a significant level. The mean use of belief-inconsistent evidence-based statements was 2.21 ($SD = 1.86$) for the collaborative writing condition and 1.21 ($SD = 1.05$) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the use of belief-inconsistent evidence-based statements by students who participated in collaborative writing was 1.829 times the use of belief-inconsistent evidence-based statements by those who didn’t, a significant difference, Wald $X^2$ adj (1, $N = 58$) = 6.657, $p = .010$ (To account for multiple testing, the Bonferroni correction...
was used and differences were considered significant only for \( p < .025 \). This difference is noteworthy in view of the cognitive challenges the use of these subtypes of functional evidence-based statements poses on students and, moreover, it indicates that the addition of the collaborative writing activity is effective in accelerating argument skill development.

Furthermore, the proportion of students who ever used belief-inconsistent evidence-based statements in the intervention topic essay was 79% for the collaborative writing condition and 69% for the individual writing condition, a non-significant difference, \( X^2 (1, N = 58) = .809, p = .368 \). Thus, even though more students in the collaborative writing condition were able to draw on evidence to make belief-inconsistent statements, the non-significant difference indicates that there is still room for growth.

However Clauses. Given that belief-inconsistent statements (i.e., support-other and weaken-my) don’t lead to the writer’s main conclusion, the most skilled way to employ these statements is by coordinating them with statements that serve as counterarguments or rebuttals (Kuhn, Hemberger & Khait, 2016b; Nussbaum & Schraw, 2007; Leitão, 2000). I examine further here whether the groups differed in the ability to integrate inconsistent arguments and counterarguments, which will be referred here as however clauses because they usually take the form of “I see your point; however...” In this sense, however clauses are defined as two adjacent statements explicitly connected by a conjunction, such as “however” or “but”. The mean use of evidence-based however clauses was 0.52 \((SD = 0.68)\) for the collaborative writing condition and 0.31 \((SD = 0.60)\) for the individual writing condition. The small number of however clauses in each condition does not warrant statistical analysis to test whether group differences are significant.
In sum, the addition of a collaborative writing activity produced gains in the quantity of ideas generated by students, as well as in the quality of statements. The collaborative writing group made significantly more functional evidence-based statements than the individual writing group, which indicates that the addition of the collaborative writing activity is effective in enhancing the core argumentative ability to coordinate evidence with claims. The collaborative writing condition also exceeded the individual writing condition in each of the subtypes of functional evidence-based claims, with statistical significant group differences in both belief-consistent and belief-inconsistent combined categories. Of special interest here is the fact that students who participated in collaborative writing surpassed those who didn’t in the ability to draw on evidence to make claims inconsistent with their favored position. This result is consistent with the hypothesis that participation in collaborative writing after engagement in dialogic argumentation draws students’ attention away from the adversarial dimension of argumentation and provides a bridge for skilled argumentive writing.

Although the results indicate students’ progress in the use of the inconsistent subtypes of functional evidence-based statements, it also indicates, nevertheless, that there is still room for improvement with respect to how students address such statements. In particular, both conditions rarely used the more advanced however clauses.

Individual Essays on a Transfer Topic

Does the addition of a collaborative writing activity produce gains in argumentive writing skill that transfer to writing on new topics? To address this question (RQ2a), the collaborative
writing group’s individual essays on the transfer topic were compared to those of the individual writing group.

I again first consider the length (total number of idea units an essay contains). The mean length of essay was 7.86 ($SD = 3.46$) for the collaborative writing condition and 6.60 ($SD = 2.21$) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the transfer essays written by students who participated in collaborative writing was 1.190 times the length of essays written by those who didn’t, a non-significant difference, Wald $X^2$ adj ($1, N = 58$) = 2.836, $p = .092$. Thus, there is no evidence to believe that the addition of collaborative writing activities increased the chance that the quantitative gains observed in the intervention topic individual essays were transferred to the new transfer topic.

Of special interest for the present work are the transfer of qualitative gains. Functional evidence-based statements accounted for 77% and 62% of statements written by the collaborative writing and the individual writing groups, respectively. As seen in Table 8, the mean number of functional evidence-based statements was 6.04 ($SD = 2.86$) for the collaborative writing condition and 4.07 ($SD = 2.02$) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the use of functional evidence-based statements by students who participated in collaborative writing was 1.484 times the use of functional evidence-based statements by those who didn’t, a significant difference, Wald $X^2$ adj ($1, N = 58$) = 9.432, $p = .002$. Thus, the addition of the collaborative writing activities increased the chance that students transferred the ability to coordinate evidence with claims, a core component of argument skill development.
Table 8

Mean (and SD) Number of Functional and Evidence Statements by Condition for the Transfer Topic

<table>
<thead>
<tr>
<th></th>
<th>Collaborative Writing Condition (n = 28)</th>
<th>Individual Writing Condition (n = 30)</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based*</td>
<td>6.04 (2.86)</td>
<td>4.07 (2.02)</td>
<td>1.484</td>
</tr>
<tr>
<td>Non-evidence-based</td>
<td>1.07 (1.18)</td>
<td>0.43 (0.86)</td>
<td>2.473</td>
</tr>
<tr>
<td><strong>Non-functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based</td>
<td>0.25 (0.70)</td>
<td>0.83 (1.23)</td>
<td>.300</td>
</tr>
<tr>
<td>Non-evidence-based*</td>
<td>0.50 (0.64)</td>
<td>1.27 (1.39)</td>
<td>.395</td>
</tr>
</tbody>
</table>

*To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for $p < .0125$.

I examine further group differences with respect to the four subtypes of functional evidence-based statements (support-my, weaken-other, support-other and weaken-my). As seen in Figure 3, engagement in the curriculum seems to lead to lasting gains with respect to use of statements that are consistent with the students’ own positions (support-my and weaken-other). Furthermore, the addition of collaborative writing activities appears to enhance the transfer of support-my and weaken-other usage, compared to individual writing only. I turn now to examine whether these apparent differences across conditions are statistically significant.

**Belief-Consistent Evidence-Based Statements.** Both groups used belief-consistent evidence-based statements in their transfer essays more frequently compared to the intervention essays, which indicates that deep engagement with the topic is needed to overcome predominance of belief-consistent arguments in essays. The mean use of belief-consistent evidence-based statements in the transfer essay was 5.43 ($SD = 2.75$) for the collaborative writing condition and 3.63 ($SD = 1.94$) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the use of belief-consistent
evidence-based statements by students who participated in collaborative writing was 1.494 times the use of belief-consistent evidence-based statements by those who didn’t, a significant difference, Wald $X^2_{adj} (1, N = 58) = 8.462, p = .004$ (To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for $p < .025$). Thus, the addition of collaborative writing activities increased the chance that students produced evidence-based arguments consistent with their own positions in a transfer topic essay.

Furthermore, the proportion of students who ever used belief-consistent evidence-based statements in the transfer essay was 100% for the collaborative writing condition and 97% for
the individual writing condition, a non-significant difference as assessed by Fisher’s Exact Test ($p = .517$). Thus, even though almost all students in both conditions were able to draw on evidence to make belief-inconsistent statements in the transfer essay, students who participated in collaborative writing were able to draw more on evidence to make claims that both support their positions and acknowledge weaknesses of the opposing position.

**Belief-Inconsistent Evidence-Based Statements.** As expected, there was a considerable reduction of use of support-other and weaken-my evidence-based statements in the transfer topic for both groups. The mean use of belief-inconsistent evidence-based statements was 0.61 ($SD = 0.92$) for the collaborative writing condition and 0.43 ($SD = 0.82$) for the individual writing condition. A Generalized Linear Model (GLM) with the Poisson distribution indicated the use of belief-inconsistent evidence-based statements by students who participated in collaborative writing was 1.401 times the use of belief-inconsistent evidence-based statements by those who didn’t, a non-significant difference, Wald $X^2$ adj (1, $N = 58$) = .572, $p = .450$ (To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for $p < .025$). Thus, there is no reason to believe that the gains in the use of belief-inconsistent statements observed in the intervention essays were more likely to be transferred to the transfer essays. This result points to the need of more opportunities for students to deeply engage with topics and in peer discourse.

Furthermore, the proportion of students who ever used belief-inconsistent evidence-based statements in the transfer topic essay was 43% for the collaborative writing condition and 30% for the individual writing condition, a non-significant difference, $X^2$ (1, $N = 58$) = 1.037, $p =$
Thus, a similar proportion of students in both conditions were able to draw on evidence to make belief-inconsistent statements.

*However clauses.* The mean use of evidence-based *however clauses* was 0.36 (*SD = 0.49*) for the collaborative writing condition and 0.20 (*SD = 0.48*) for the individual writing condition. Once again, the negligible number of *however clauses* in each condition does not warrant statistical analysis to test whether group differences are significant.

In sum, students’ performance on the transfer essays point to the effectiveness of the addition of the collaborative writing activities, in particular in the increased ability to use evidence to weaken as well as support claims. Effects were lesser in the more challenging categories of acknowledging positives of the opposing position and weaknesses of own position and in integrating these with claims favorable to one’s own position.

*What the Intervention Accomplished?*

Given that the school only counted with two entering sixth-grade classes, I am unable to compare the participating groups’ performance with an equivalent non-participating control group. Instead, I assessed the writing performance of an older seventh-grade class that is somewhat more capable than the participating classes. A reason for the non-equivalence of groups is that the seven graders all come from private elementary schools, while the sixth graders come from either private or public elementary schools (In 2017, the school reserved half of admissions for students from public schools). I compare, therefore, the performance of the non-
participating control group in the transfer topic with the performance of the collaborative writing condition. I chose to focus analysis on the collaborative writing condition as the group who performed most favorably in terms of argument skill and therefore benefited the most from the intervention. The objective here is to assess the overall effectiveness of the argument curriculum.

As seen in Table 9, the control group \( (M = 8.23) \) wrote longer essays, compared to the collaborative writing group \( (M = 7.86) \). The collaborative writing group \( (M = 6.04) \), however, surpassed the control group \( (M = 5.40) \) in the mean number of functional evidence-based statements made. With regard to differences across groups in the belief-consistent (i.e., support-my and weaken-other) and belief-inconsistent (i.e., support-other and weaken-my) evidence-based subcategories, the mean number of belief-consistent evidence-based statements for the collaborative writing group \( (M = 5.43) \) surpassed those for the control group \( (M = 4.30) \). The results so far seem to corroborate previous studies in indicating that deep engagement with topics and in peer discourse plays a key role in the development of argumentive writing (Zillmer & Kuhn, 2018).

Table 9

<table>
<thead>
<tr>
<th>Mean (and SD) Number of Statements by Condition for the Transfer Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative Writing Group (n = 28)</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td><strong>Length of Essays</strong></td>
</tr>
<tr>
<td>7.86 (3.46)</td>
</tr>
<tr>
<td><strong>Belief-consistent</strong></td>
</tr>
<tr>
<td><strong>Belief-inconsistent</strong></td>
</tr>
<tr>
<td>8.23 (3.94)</td>
</tr>
<tr>
<td>4.30 (2.94)</td>
</tr>
</tbody>
</table>

Unexpectedly, the pattern was inverted for the belief-inconsistent evidence-based statements, with the control group \( (M = 1.10) \) appearing to outperform the collaborative writing group \( (M = 0.61) \). From the data, there is an evident difference between groups that might inform
this unexpected result. Before writing their essays, students were asked to indicate whether they were either in favor, against or undecided with regard to the transfer topic. While not a single student in the collaborative writing condition indicated the undecided position, 5 students (17%) of control students did so. Because of some students’ avoidance to take a stance on the topic, essays of control students may have been more likely to include arguments for both sides. This inference, however, should be regarded as a speculation only since causal inferences cannot be made from this comparison.

Regardless of the explanation of this unexpected result, I believe that the fact that all students in the collaborative writing condition assumed a position about the topic may also be an argument skill component under development. For instance, assuming a position may indicate an epistemological understanding that knowledge is not a matter of right or wrong answers. Instead, students may have become to understand that they must take a stance or make a decision with respect to controversial issues, although being aware of some of its weaknesses.

Although a clear conclusion cannot be made from this comparison, I am confident based on observations and experiences from previous studies that the argument curriculum was successful in developing skills that otherwise would not have been developed by regular instruction. This inference will be later supported by the examination of group differences in the more challenging transfer task assessments.
**High-level Argument Skills**

I turn now to report on two additional transfer tasks, i.e., argument evaluation and evidence selection. As outlined in Table 10, the analysis reported in this subsection addresses high-level transfer gains. Compared to the production of arguments, these tasks are more cognitively challenging given that they require effective use of meta-knowledge with respect to argument. As later described, the addition of the collaborative writing activity to the curriculum was not sufficiently effective to produce high-level transfer gains.

Table 10

Operationalization of High-Level Argument Skills Research Questions

<table>
<thead>
<tr>
<th>Research Question</th>
<th>How the RQ was addressed</th>
<th>Variables</th>
</tr>
</thead>
</table>
| High-level Transfer Gains                               | Comparison between the collaborative writing, individual writing and control groups’ performance on two transfer tasks. | - Ability to evaluate arguments  
- Ability to anticipate the type of evidence relevant for essay writing |

**Evaluation of Arguments**

I examine here whether there were differences across conditions with respect to the ability to evaluate arguments in a new task (RQ2b). Instead of making their own arguments, students were asked to identify the more effective counterargument of two options. The stronger option countered the interlocutor’s argument by directly criticizing and attempting to weaken it (counter-critique). The weaker option countered it by advancing an alternative argument (counter-alternative). I expected that group differences found in essays might appear as well in a new task that assesses evaluation rather than production.
Possible scores range from zero to seven. The minimum score (zero) indicated that all choices made were counter-alternative arguments and the maximum (seven) that all choices were counter-critique arguments. Mean scores were very similar across groups, 4.32 ($SD = 1.36$) for the collaborative writing group, 4.79 ($SD = 1.18$) for the individual writing group and 4.59 ($SD = 1.53$) for the non-participating control group. A one-way ANOVA $^3$ indicated no significant main effect of group, $F(2, 81) = 0.864$, $p = 0.425$. Thus, there is no indication that the enhanced counterargument skills observed by the increased use of weaken-other evidence-based statements in transfer essays was accompanied by greater skill in argument evaluation.

Anticipated Use of Evidence

I examine here whether students anticipated the types of evidence that would be useful to them in writing their essay. Students were asked to indicate a preference to have access to one type over another. As seen in Table 11, the majority of students who participated in the curriculum indicated that they would like to have access to evidence types consistent with their position (support-my and weaken-other) for first and second choices. This pattern changes slightly for the non-participating control group who shows preference for support-my in both choices, but indicates all other types of evidence at the same level for the second choice.

I predicted that students who participated in collaborative writing would show greater meta-level understanding of the goals of using evidence in essays, compared to students in the individual writing and the non-participating control groups (RQ2c). The collaborative writing and individual writing conditions showed, however, very similar pattern of choices. Thus, there

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$^3$ Given that the distributions deviate from the normal, a non-parametric test (Kruskal-Wallis H test) was also run. Both parametric and non-parametric tests yielded the same results, $p > .05$.
is no indication that the addition of collaborative writing activities increased students’ meta-level understandings regarding evidence. I then collapsed these groups into a participating group category. To comply with assumptions of the Chi-square test of independence, I also collapsed the subtypes into own-side evidence (support-my and weaken-other) and other-side evidence (support-other and weaken-my) categories.

Table 11

<table>
<thead>
<tr>
<th></th>
<th>Collaborative Writing Condition (n = 28)</th>
<th>Individual Writing Condition (n = 30)</th>
<th>Control Condition (n = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Choice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support-my</td>
<td>71%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Weaken-other</td>
<td>25%</td>
<td>23%</td>
<td>27%</td>
</tr>
<tr>
<td>Support-other</td>
<td>0%</td>
<td>17%</td>
<td>10%</td>
</tr>
<tr>
<td>Weaken-my</td>
<td>4%</td>
<td>0%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Second Choice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support-my</td>
<td>39%</td>
<td>35%</td>
<td>31%</td>
</tr>
<tr>
<td>Weaken-other</td>
<td>39%</td>
<td>38%</td>
<td>23%</td>
</tr>
<tr>
<td>Support-other</td>
<td>4%</td>
<td>10%</td>
<td>23%</td>
</tr>
<tr>
<td>Weaken-oy</td>
<td>18%</td>
<td>17%</td>
<td>23%</td>
</tr>
</tbody>
</table>

As first choice of evidence they would like to see, 90% of the participating group and 77% of the non-participating control group chose own-side evidence as the categories they would most like to see, a non-significant group difference, $X^2 (1, N = 88) = 2.649, p = .355$. In choosing the evidence types they would like to see second most, the great majority (75%) of the participating group maintained their option for own-side evidence by selecting support-my and weaken-other approximately at the same level. Only slightly above half (54%) of the non-participating control group, however, chose own-side evidence as the categories they would second most like to see, a significant difference between groups, $X^2 (1, N = 87) = 4.400, p =$
Thus, the data reported here replicates previous findings (Shi, Matos & Kuhn, in press) that engagement in the argument curriculum enhances students’ meta-level understanding of argumentive goals.

*Socio-Discursive Mechanisms*

Now that I have identified that the addition of collaborative writing enhanced students’ skill in individual argumentive writing in intervention and transfer topics, I aim to shed light on the socio-discursive mechanisms underlying the effectiveness of engagement in collaborative writing. Specifically, I examine whether collaboration with an agreeing or disagreeing partner is more effective (RQ3). Toward this end, I first compare the joint essays written by the collaborative writing group and the individual essays written by the individual writing group at the same time point during the intervention. I then turn to identify potential differences between peer discursive interaction during same-side and opposing-side collaborative writing work.

*Comparison between Joint and Individual Essays.* For the first topic, students in the collaborative writing condition were assigned to write their essays in same-side pairs; in the second topic they were assigned to write their essays in opposing-side pairs. I first compare here the same-side joint essays with the individual essays written by the individual writing group at the end of the first intervention topic. Same-side joint essays ($M = 10.92; SD = 3.38$) were 1.476 times longer than individual essays ($M = 7.40; SD = 3.16$), a significant difference, Wald $X^2$ adj $(1, N = 43) = 10.432, p = .001$. As seen in Table 12, the enhanced number of idea units generated by same-side pairs reflected their greater skill in making functional evidence-based statements compared to students working alone, Wald $X^2$ adj $(1, N = 43) = 24.546, p < .001$. 

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With respect to the four functional subtypes, same-side pairs \((M = 7.15; SD = 2.27)\) used belief-consistent evidence-based statements significantly more than did students who worked alone \((M = 3.40; SD = 2.08)\), Wald \(X^2\) adj \((1, N = 43) = 24.284, p < .001\). There was no significant difference between same-side pairs \((M = 1.23; SD = 1.09)\) and students working alone \((M = 0.87; SD = 0.77)\) with respect to mean use of belief-inconsistent evidence-based statements, Wald \(X^2\) adj \((1, N = 43) = 1.572, p = .210\). Thus, there is evidence to believe that same-side collaborative work was effective in surpassing individual work, in particular in the ability to draw on evidence to make claims that are consistent with their favored position.

Table 12

<table>
<thead>
<tr>
<th>Functional Evidence-based*</th>
<th>8.38 (3.17)</th>
<th>4.27 (2.12)</th>
<th>1.965</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-evidence-based</td>
<td>0.69 (0.75)</td>
<td>1.63 (1.88)</td>
<td>.076</td>
</tr>
<tr>
<td>Non-functional Evidence-based</td>
<td>0.23 (0.44)</td>
<td>0.13 (0.35)</td>
<td>1.731</td>
</tr>
<tr>
<td>Non-evidence-based</td>
<td>1.61 (1.45)</td>
<td>1.37 (1.77)</td>
<td>1.182</td>
</tr>
</tbody>
</table>

*To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for \(p < .0125\).

I now turn to compare the opposing-side joint essays with the individual essays written by the individual writing group at the end of the second intervention topic. Opposing-side joint essays \((M = 4.14; SD = 2.68)\) were 0.977 times shorter than individual essays \((M = 4.24; SD = 2.50)\), a non-significant difference, Wald \(X^2\) adj \((1, N = 43) = .014, p = .906\). As indicated in Table 13, opposing-side partners wrote essays similar in quality to those written by students working alone. There was no significant group difference in the mean number of functional and
evidence statements, except for the number of non-functional evidence-based statements. Thus, there is no evidence to believe that opposing-side group work was effective in surpassing individual work.

The comparisons between joint and individual essays suggest that collaboration with an agreeing partner may be more effective than with a disagreeing one. Yet, an argument can be made that the analysis of joint essays, as the products of collaboration, may not depict the richness of the collaborative process. It may be the case that the discourse disagreeing pairs engaged in included more dialogic interaction, compared to agreeing pairs discourse, which could have a delayed rather than an immediate effect on individual skill. For this reason, I now turn to an analysis of the discourse agreeing and disagreeing partners engaged in.

Table 13

<table>
<thead>
<tr>
<th></th>
<th>Opposing-side Collaborative Writing Condition (n = 14)</th>
<th>Individual Writing Condition (n = 29)</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based</td>
<td>2.14 (2.21)</td>
<td>2.38 (1.82)</td>
<td>.901</td>
</tr>
<tr>
<td>Non-evidence-based</td>
<td>.36 (.63)</td>
<td>1.03 (1.18)</td>
<td>.345</td>
</tr>
<tr>
<td><strong>Non-functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based*</td>
<td>.71 (1.14)</td>
<td>.14 (.35)</td>
<td>5.179</td>
</tr>
<tr>
<td>Non-evidence-based</td>
<td>.93 (.92)</td>
<td>.69 (1.31)</td>
<td>1.346</td>
</tr>
</tbody>
</table>

*To account for multiple testing, the Bonferroni correction was used and differences were considered significant only for \( p < .0125 \).

Comparison between Same-Side and Opposing-Side Talk. A total of twelve audios, six from same-side and six from opposing-side collaboration, was randomly selected for analysis. The audios were transcribed into dialogical sequences, as a grouping of discursive turns that
express the same dialogical intention. Adapting a dialogical scheme from Macagno and Bigi (2017), I coded the dialogical sequences into four main categories that indicate dialogical intentions relevant for the collaborative writing task. These categories are listed below:

1. Content sharing: dialogue sequences aimed at retrieving and providing information about the topic content. This category included the sharing of ideas for arguments, as well as the sharing of information from the evidence list.

2. Persuasion: dialogue sequences aimed at persuading the partner. This category included students’ attempts to convince others to accept their position on the topic.

3. Deliberation: dialogue sequences aimed at making a decision. This category included students’ attempt to decide together whether a piece of evidence should be added to the text and whether a specific strategy should be used in their writing process.

4. Off-topic: dialogue sequences that are not relevant to the collaborative writing goal.

An overall comparison between same-side and opposing-side dialogical interactions suggests that both types of talk were productive. The most common dialogical intention in agreeing interaction was content sharing, which accounted for 44% of their dialogical sequences (Table 14). Agreeing partners focused mainly on sharing arguments and information that served to support their position. The special attention given to sharing content by the agreeing partners reinforces the inference that the enhanced use of belief-consistent functional evidence-based statements in the same-side joint essays was a product of group work.

Content sharing was also one of the most common dialogical intentions in disagreeing interaction, although the focus on sharing content was less accentuated and accounted for only
35% of dialogical sequences. As seen in Table 14, deliberation also accounted for 35% of dialogical sequences in opposing-side talk, a considerable difference from the 22% of sequences devoted to deliberation in same-side talk. The enhanced attention given to deliberation by disagreeing partners gives me confidence that this type of talk was effective in promoting students’ argumentive writing skills, despite the fact that opposing-side joint essays did not surpass individual essays in overall quality.

Table 14

<table>
<thead>
<tr>
<th>Percentage of Dialogical Sequences by Intention Categories and Type of Talk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same-side Collaborative Writing Talk (n = 6)</td>
</tr>
<tr>
<td>Content Sharing</td>
</tr>
<tr>
<td>Persuasion</td>
</tr>
<tr>
<td>Deliberation</td>
</tr>
<tr>
<td>Off-topic</td>
</tr>
</tbody>
</table>

A further examination of the deliberation category can help to illuminate the potential effectiveness of engagement in opposing-side talk. Disagreeing partners had necessarily to deliberate about argumentive writing strategies in a joint effort to overcome the challenge of integrating the opposing positions. They devoted most of their deliberation dialogues (82%) to deciding whether a specific writing strategy should be used. Most frequently, disagreeing partners deliberated about argumentive writing strategies, rather than about other writing strategies that involved text form and writing style. Deliberating about argumentive writing strategies required more time and effort from the pairs who ended up with final products no longer than a couple of paragraphs. Analysis of the transcripts suggests that the increased effort and, perhaps, struggle of pairs to figure out how to integrate inconsistent arguments may exerts
delayed benefits on students’ skill development. This inference is consistent with previous studies (Kapur & Bielaczyc, 2012), and supported by the previously reported results that the collaborative writing condition showed enhanced use of belief-inconsistent evidence-based statements on the intervention topic individual essays.

Contrastingly, agreeing partners didn’t have necessarily to deliberate before start writing the essay and, in fact, they usually didn’t. Their deliberation dialogues appeared later in the collaborative writing process and, similar to disagreeing partners, they devoted most of their deliberation dialogues (60%) to deciding whether a specific writing strategy should be used. The main difference between same-side, relative to opposing-side, talk was that the writing strategies under discussion didn’t necessarily address the specificities of written arguments. Instead, agreeing students tended to deliberate more about text form and writing styles.

In summary, the analysis suggests that both same-side and opposing-side collaborative writing may have been effective. In agreeing pairs, students worked together in co-constructing arguments that favored their own position over the alternative. Engagement in this type of discourse may be effective because it exposes students to a greater number of ideas and strategies, and, moreover, it prompts students to explain their idea to others which is reported in previous studies as having potential to create a common understanding about the shared activity and promote increased performance (Voiklis & Corter, 2012).

In disagreeing pairs, students were required to integrate their views with those of their partners, which added another level of skill that seemed to promote agreement on the need to come up with a shared understanding on how to overcome the challenge. In the next chapter, I
reflect more about the discourse students engage in same-side and opposing-side collaborative writing by presenting selected case studies.
CHAPTER 4
DISCUSSION

The research presented here examined whether collaborative writing, in the context of dialogic argumentation, is a further contributor to the development of middle school students’ individual argumentive writing. Students in two sixth grade classes participated in a concentrated month-long dialog-based argument curriculum that promotes deep engagement with peer discourse on a series of topics. Groups differed only with respect to engagement in collaborative writing. Analyses of intervention and transfer topic individual essays support the claim that the addition of a collaborative writing activity to a dialogic curriculum is effective in enhancing students’ argumentive writing skills.

Principal Findings

It was hypothesized that collaborative writing would serve as a bridge between dialogic and individual written argumentation by drawing students’ attention from the adversarial to the collaborative dimensions of argumentation. It was expected that engagement in the collaborative writing activity would enhance not only students’ procedural argumentive writing skills but also their meta-level understanding of argument’s goals. As summarized in the following paragraphs, these hypotheses were partially confirmed. Students who engaged in collaborative writing showed enhanced argumentive writing skills, relative to those who didn’t. Performance didn’t differ, however, in more challenging assessments of students’ meta-knowledge with respect to argument.
Gains in procedural skills were assessed through intervention and transfer topic individual essays. Analysis of intervention topic essays indicates that collaborative writing is a further contributor in the development of argumentive writing skill. Students who had previously engaged in collaborative writing when later writing individually tended to generate more arguments, compared to students who didn’t engage in collaborative writing. More importantly, the arguments generated by students in the collaborative writing condition were more likely to include evidence and to be successfully employed in service of a claim. The collaborative writing group surpassed the individual writing group in drawing on evidence to address claims consistent as well as inconsistent with their favored position. This finding is significant in light of previous findings reporting that after engagement in the dialogic curriculum students’ skill is largely limited to using evidence to support claims consistent with their favored position (Hemberger et al., 2017). The results reported here, therefore, indicate that a combination of a dialogic approach with collaborative writing activities can accelerate students’ argument skill development.

In transfer topic essays, the individual performance of students in the collaborative writing condition continued to surpass that of students in the individual writing condition with respect to the ability to coordinate evidence with claims, specifically in drawing on evidence to make claims that are consistent with their favored position. Absent the deep engagement with the topics that the curriculum topics, but not transfer topics, provided, groups didn’t differ with regard to using evidence to address claims inconsistent with their position. Students in both groups in transfer essays tended to use evidence to support claims that predominantly served to support their own position. The fact that students in the collaborative writing condition tended to make more belief-consistent evidence-based statements in support of their own position in
transfer topic essays suggests that the addition of collaborative writing activities enhanced their skills in a way consistent with developmental goals (Kuhn et al., 2016b). The same pattern of argumentative writing skill development was observed in both groups. The addition of collaborative writing activity accelerated, rather than changed the course of, students’ progress.

It was also hypothesized that the addition of the collaborative writing activities would lead to gains in students’ meta-level understanding of argument’s goals. There were no significant differences between collaborative writing and individual writing groups with respect to students’ ability to evaluate arguments and anticipate the type of evidence they would like to use in their essays. Thus, these results indicate that engagement in collaborative writing didn’t lead to more understanding regarding the goals of argument.

**Implications**

The results suggest that the combination of dialogic and collaborative forms of peer argumentation in instruction is a productive path for developing adolescents’ argumentive writing skills. This suggestion has theoretical and practical implications.

Theoretically, the fact that the addition of the collaborative writing activity to the dialogic curriculum proved effective indicates that the benefits of engagement in peer discourse to argument skill development are not restricted to simple opposition of views. It indicates, rather, that different forms of peer discourse can create a rich classroom setting that promotes multiple competencies important to argumentation. In particular, the addition of the collaborative writing activities appeared to enrich the classroom setting by drawing students’ attention from pursuing diverging goals of advancing their own positions to a converging goal of writing a good argumentative essay. As evidence of this, the excerpt in Table 15 illustrates how a pair engaged in
same-side collaborative writing considers whether support-other arguments should be included in their essay. The pair favors animal research.

Table 15
Audio-recorded discourse of A1 and A2 in Same-Side Collaborative Writing

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Utterance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Let’s write ‘I agree that any animal can be used in research but taking another perspective I also agree that they’ll feel pain’.</td>
</tr>
<tr>
<td>A2</td>
<td>Are you on our side or on their side? Answer me.</td>
</tr>
<tr>
<td>A1</td>
<td>No, I’m on our side.</td>
</tr>
<tr>
<td>A2</td>
<td>You’re helping them.</td>
</tr>
<tr>
<td>A1</td>
<td>Don’t you agree the animals will feel pain?</td>
</tr>
<tr>
<td>A2</td>
<td>Yeah, I agree.</td>
</tr>
<tr>
<td>A1</td>
<td>That’s it then.</td>
</tr>
</tbody>
</table>

(This turn is followed by silence and then students move to another subject)

As seen in the excerpt above, the same-side pair disagrees on whether acknowledging strengths of the opposing position in written arguments is appropriate. While A2 believes that they shouldn’t acknowledge a strength of the other side because it would help to advance the opposing position, A1 argues that they should since they agree with a specific claim. Implicit in their discourse is the view of argument as a dispute between opposing views. It is known from previous studies (Asterhan, Butler & Schwarz, 2010) that engagement in dialogic argumentation can accentuate students’ limited perception of argument simply as dispute, and so the fact that
the collaborative writing activity promoted meta-level reflection regarding argument’s goals suggests that this activity was an enriching one. In particular, the excerpt indicates that during collaborative writing students explored key issues regarding arguments. The implication is that the richer classroom setting promoted the development observed in students’ individual essays, an implication consistent with a sociocultural approach (Vygotsky, 1978; Rowe & Wertsch, 2004). Besides providing support for the premise that cognitive processes appear first at the inter-mental level and are then transferred to the intra-mental level, the present study provides further support for the notion that students are able to regulate and scaffold one another at the meta-level. Even though groups didn’t differ with respect to their performance in high-level transfer tasks, the excerpt in Table 15 (and overall pattern of collaborative writing talk) corroborates evidence that suggests metacognitive benefits of peer collaboration (Zillmer & Kuhn, 2018).

A second theoretical implication concerns the fact that the collaborative writing activities were added after students had engaged in dialogic argumentation. I hypothesized that collaborative writing would provide a bridge between dialogic and individual argumentation based on the assumption that collaborative argumentation requires more sophisticated competence, relative to dialogic argumentation. Table 16 presents an excerpt that illustrates the different skills required in opposing-side collaborative writing. In the following excerpt, D1 and D2 have acknowledged that they favor different positions. They proceed to engage in planning how to structure the essay in a way that incorporates both positions.
Table 16

Audio-recorded discourse of D1 and D2 in Opposing-Side Collaborative Writing

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Utterance</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>People who work right now contribute...</td>
</tr>
<tr>
<td>D2</td>
<td>But, wait, we’re going to write undecided.</td>
</tr>
<tr>
<td>D1</td>
<td>But how are we going to write undecided?</td>
</tr>
<tr>
<td>D2</td>
<td>We can explain both sides. I say we should save on our own and you say we should contribute to the government.</td>
</tr>
<tr>
<td>D1</td>
<td>And are we writing two essays?</td>
</tr>
<tr>
<td>D2</td>
<td>No, two paragraphs. One talks about contributing and the other ‘but’…</td>
</tr>
<tr>
<td>D1</td>
<td>Calm down, how many paragraphs are we writing? 1, 2, 3, 4, 5 paragraphs.</td>
</tr>
<tr>
<td>D2</td>
<td>The first two I say my position and the other two you say yours. And the last is the conclusion, so we say ‘We have different positions and that’s why…’</td>
</tr>
<tr>
<td>D1</td>
<td>Ok, so each of us write one idea.</td>
</tr>
<tr>
<td>D2</td>
<td>Yeah.</td>
</tr>
<tr>
<td>D1</td>
<td>Teacher, come here, should we write only one essay or two essays?</td>
</tr>
<tr>
<td>Teacher</td>
<td>Only one.</td>
</tr>
<tr>
<td>D1</td>
<td>It’s difficult to explain both ideas in only one text. We’ll say that we’re undecided.</td>
</tr>
<tr>
<td>D2</td>
<td>I thought about writing in paragraphs. In the first I say my position, then in the second she says hers. Then we say ‘She thinks this should be done, but I think that this other option is better’</td>
</tr>
<tr>
<td>D1</td>
<td>But it’s going to be difficult to write because we think different.</td>
</tr>
<tr>
<td>Teacher</td>
<td>D2’s idea is a very good start. Try to integrate your positions in each paragraph.</td>
</tr>
</tbody>
</table>
As seen in the excerpt above, the task of incorporating both positions in a single essay seems difficult to the students and, perhaps, nonviable to D1. Her teammate, however, can envision writing a text with arguments for both sides. The discursive interaction between D1 and D2 indicates that the addition of the collaborative writing activity not only creates a rich discursive opportunity but also promote students’ engagement in reflecting and using more advanced argumentive strategies. Specifically, the opposing-side pair in the excerpt above engaged in metacognitive reflection about how to co-construct opposing-side arguments. An inference warranted by the quantitative analysis is that this kind of metacognitive reflection was effective in enhancing students’ progress.

It is suggested here, nevertheless, that engagement in collaborative argumentation was effective because it followed engagement in dialogic argumentation. The main reason for advocating that the order is crucial is the fact students struggled with co-constructing arguments even after deep engagement with the topic. This struggle suggests that the skills entailed in collaborative argumentation, although related to those entailed in dialogic argumentation, are more sophisticated. Collaborative argumentation, and specially opposing-side collaborative writing, required students to attend necessarily to belief-inconsistent arguments on top of requiring all of the skills entailed in dialogic argumentation. Dialogic argumentation, however,
can proceed with the most elementary skills, such as supporting claims with reasons and evidence, and making counterclaims.

The present study results, therefore, are consistent with others (Kuhn et al., 2016b) in claiming that there is a developmental progression in argumentive writing that should be accounted for in classroom instruction. The broad theoretical implication here is that elementary skills need first to be exercised and developed before meaningful engagement can occur in tasks that require more advanced skills. In particular for argument skill development, it is argued that students must first engage in critique to gain the skills necessary for engaging in argument as an authentic co-construction and evaluation of ideas.

Practically, the fact that the addition of the collaborative writing activity to the dialogic curriculum proved effective indicates that dialogic approaches can be improved by the integration of collaborative forms of peer argumentation. Although dialogic approaches have been shown to be effective, accomplishments with respect to attention to and attempts to weaken opposing claims are limited (Hemberger et al., 2017). In this light, the gains observed in the present study have significance. In particular, this result promotes confidence in instructional approaches that combine adversarial and collaborative forms of peer argumentation. Combining these forms exposes students to the different dimensions of argumentation and give them opportunity to exercise thinking within these dimensions.

A second practical implication concerns the special attention given to construction over critique in classroom instruction (Henderson et al., 2015). Previous studies report that classroom instruction is for the most part based on teacher-centered activities that promote argument construction. Dialogic approaches, however, are based on student-centered activities that promote critical discourse. The fact that the addition of the collaborative writing activity to the
dialogic curriculum proved effective can make dialogic approaches more appealing to educators and more applicable to classroom needs. Collaborative writing, for instance, is a feasible and already often used classroom practice, and so its integration with dialogic argumentation can align better with educators’ goals.

A final practical implication concerns the fact that the individual writing group had two class sessions to work on their essays for the final intervention topic. That is, these students engaged in revising and rewriting their essays, what is understood in the literature as a major component of teaching argumentive writing (Ferretti & Lewis, 2013). The present study, however, does not provide support for the claim that engagement in revision was more beneficial than engagement in collaboration in any aspect observed. While some students may have the ability to self-regulate and improve writing by revision, this wasn’t the case for students in the present study. Thus, it is argued here that activities that foster metacognitive regulation between peers, rather than those that promote self-regulation, should be favored in argument instruction, especially at the middle-education level.

Limitations and future research

The comparison between collaborative writing and individual writing conditions is sound in that equivalence of groups was assessed through scores in the school entrance exam and the conditions only differed with respect to engagement in collaborative writing. The comparison between these conditions and a non-participating control group, however, is the primary limitation of the present study. Given that the school only counted with two entering sixth-grade classes, I relied on assessing the overall effectiveness of the dialogic curriculum by comparing the performance of students in the collaborative writing condition with those of an older seventh-
grade class that is somewhat more capable. The descriptive analysis indicated that the collaborative condition surpassed the control condition in drawing on evidence to make belief-consistent claims; however, these results should be interpreted with caution given the non-equivalence of groups and the accompanying threats to internal validity.

A second limitation concerns the third research question, i.e., whether essay writing collaboration with an agreeing or disagreeing partner is more effective. This study’s main research questions examine the benefits of the addition of collaborative writing to the dialogic curriculum and, for this reason, I relied on a quasi-experimental study design in which the experimental condition participated in collaborative writing activities and the comparison condition didn’t. For the first intervention topic, the experimental students participated in same-side collaborative writing. For the second, they participated in opposing-side collaborative writing. The third research question, therefore, was assessed through two comparisons, i.e., between joint essays written by the collaborative writing group and individual essays written by the individual writing group at the same time point, and between same-side and opposing-side talks. These comparisons are limited in the sense that they don’t inform about the relative benefits of engagement in same-side and opposing-side collaborative writing in individual performance. From this study’s results, both forms of collaborative writing are beneficial, in particular agreeing partners wrote better essays than individuals and disagreeing partners’ talk included a high frequency of sequences devoted to deliberation about writing strategies. These results are consistent with previous research on collaborative writing (Sampson & Clark, 2011), which pointed to effectiveness of this activity. Yet, it may be worthwhile in future research to examine whether there are group differences between conditions that only engage in one form of collaborative writing.
It is also important to acknowledge that, since the participants in the present study attended a selective public school, these students may have started out with greater capacity than the general population of middle schoolers in Brazil. As previous studies have indicated (Shi, Matos & Kuhn, in press), the dialogic curriculum is effective in non-selective public schools in the United States, and so there is reason to believe that it will also exert benefits in non-selective Brazilian schools. The question here is whether the addition of the collaborative writing activity will lead to the same effects in the general population. Possibly, there would be a need to extend the month-long intervention, which incorporates only two collaborative writing topic sequences. Thus, further research is needed to assess whether gains from participation in collaborative writing are replicated in different school contexts.

In addition, the fact that the study was conducted in Brazil may raise questions with regard to the influence of culture. As reported in the literature (Nisbett, Peng, Choi & Norenzayan, 2001), cultures differ in the way they value individual aspects, such as competition, and social aspects, such as collaboration. Some may argue that Brazil, as a Latin-American country, may nurture individuals in a way that make them more prone to collaborate with others. Even though this may be true in relation to friendship and social relations in general, there is no reason to believe that students in Brazil are more prone to collaborate intellectually. On the contrary, most classroom activities are teacher-centered and students have few or none opportunity to engage in intellectual discourse with peers. For this reason, it is assumed here that benefits of the addition of the collaborative writing to the argument curriculum would be replicated in individualistic cultures, such as the U.S. Nevertheless, further research is needed to address this issue.
Finally, one might be concerned that the effectiveness of the addition of the collaborative writing activity to the dialogic curriculum may not necessarily indicate that integrating dialogic and collaborative forms of argumentation is a productive path for argument skill development. Why should one expect that the inclusion of other forms of collaborative peer argumentation would produce similar benefits? In fact, there is not enough research to date on the effectiveness of instructional approaches that integrate the adversarial and collaborative dimensions of argumentation. Preliminary evidence, however, suggests that the addition of other forms of collaborative argumentation to dialogic approaches can lead to similar benefits. For instance, Leitão and colleagues (Leitão, 2012; Leitão et al., 2012) designed an argument curriculum in which debate activities are followed by a collaborative activity different from collaborative writing. Specifically, students engage in the formulation of relevant criteria for evaluating the arguments produced during the debate with the goal of reaching a consensual decision about the topic. This activity, similar to collaborative writing, draws students’ attention away from the adversarial dimension of argumentation and has the potential to enhance their ability to integrate opposing arguments. It is speculated here, thus, that effectiveness is not restricted to collaborative writing and other forms of collaborative peer argumentation can produce similar effects. Nevertheless, further studies are needed to confirm this hypothesis and to identify which essential features the collaborative activities must have in order to promote argument skill development.

Conclusion

Although converging evidence indicates that argumentive thinking and writing are best promoted by deep engagement with topics and in discursive interaction (Hemberger et al., 2017;
Resnick, Asterhan & Clarke, 2015), it is still unclear in the literature which instructional approaches exert most benefits and should be adopted by educators (Asterhan & Schwarz, 2016). Specifically, the psychoeducational frameworks warrant formulation of instructional approaches that promotes students’ engagement in either agreeing or disagreeing argumentive discourse.

It has been argued throughout this study that engagement in disagreeing peer discourse, especially in the form of dialogic argumentation, is a productive path for argument skill development. My approach here is consistent with others (Kuhn et al., 2016; Leitão et al., 2012) in contending that oppositional discourse has the potential to frame students’ argumentive discourse in a way that promotes development of the elementary skills of argument, most notably counterargument. As previous studies show (Barron, 2003), group work has many skill layers and is susceptible to variability, and so the fact that oppositional discourse has the potential to direct reasoning towards the use of relevant argumentive strategies makes this type of discourse particularly relevant. This is true especially for the population of middle school students investigated here.

It has also been argued that engagement in oppositional discourse is not the only contributor to the development of argumentive writing skills. In particular, my view is that argument instruction should draw students’ attention to both adversarial and collaborative dimensions of argumentation in order to exerts greater benefits. The rationale here follows philosophical notions (Mercier et al., 2017) that argumentation has complex and contradictory dimensions that place demand on reasoning. To exert most benefit, then, argument instruction should encompass the complex dimensions of argumentation in order to provide the richest social and cognitive context for argument skill development.
An opposing and, perhaps, idealistic view is that argument instruction should center only on collaborative forms of argumentation in order to promote a safe classroom setting that minimizes dispute and polarization. Arguably, however, it is not clear whether instruction based only on collaborative forms of argumentation prepares students for what their future educational and professional lives will demand of them. If similar to cognitive bias, dispute and polarization integrate one of the dimensions of argumentative reasoning, and will be present outside the school context, why not engage students in exercising how to deal with these aspects, instead of avoiding them altogether? Further research is needed to explore these issues.
REFERENCES


APPENDIX A

REFLECTION SHEETS

“OTHER” REFLECTION SHEET

Team members ________________________________
Date ____________________

Let’s think…Starting with the other side’s argument

One of the other side’s MAIN ARGUMENTS was:

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

Our COUNTERARGUMENT against their argument was:

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

Give a specific example of an improved, more effective COUNTERARGUMENT.

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
“OWN” REFLECTION SHEET

Team members________________________________________
Date __________________

Let’s think...Starting with our argument

One of our MAIN ARGUMENTS was:
__________________________________________
__________________________________________
__________________________________________

Their COUNTERARGUMENT against our argument was:
__________________________________________
__________________________________________
__________________________________________

Our COMEBACK was:
__________________________________________
__________________________________________
__________________________________________

How can this COMEBACK be improved?
Is there a more effective comeback?
__________________________________________
__________________________________________
__________________________________________
__________________________________________
APPENDIX B

WRITING PROMPT

LETTER TO THE EDITOR

Name: ____________________________________________     Date:_____________

Write a Letter to the Editor of the newspaper on this issue. Try to give as full an idea of the issue as you can for someone who hasn’t thought about the topic.

TOPIC: ANIMAL RESEARCH

In medical research labs across the country animals are used to test new medications. This testing makes it possible to develop new medications that can save human lives.

Question: Should companies be allowed to conduct this research upon animals? (Circle one)

Yes                      No                      Undecided

How sure are you of your opinion? (Circle one)

Certain Very Sure       Sure       So-so       Not very sure       Not sure at all

Feel free to use the evidence you have.

Start your letter from next page.