

Argumentation as a Collaborative Enterprise: A Study of Dialogic Purpose and Dialectical Relevance in Novice and Experienced Arguers

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Abstract: Studies of adolescents and young-adults suggest that deliberative dialogue, a form of consensus-seeking argumentation, leads to stronger learning outcomes than persuasive dialogue. However, this research has not been informed by an analysis of dialogue among more experienced arguers. In the present study, we compare the deliberative and persuasive dialogues of novice and experienced arguers to better understand the difference between these two forms of discourse at differing levels of argumentative expertise. Our results confirm theoretical distinctions between deliberation and persuasion. Results also suggest that greater experience in argumentation is associated with a richer array of argumentative purposes, producing more cohesive, intersubjective and dialectically relevant dialogue. The implications of these findings for learning are discussed.

Résumé: Des études sur les adolescents et les jeunes adultes suggèrent que le dialogue délibératif, une forme d'argumentation avec laquelle on recherche le consensus, conduit à de meilleurs résultats d'apprentissage que le dialogue persuasif. Cependant, cette recherche n'a pas été éclairée par une analyse du dialogue entre des gens plus expérimentés dans l'argumentation. Dans la présente étude, nous comparons les dialogues délibératifs et persuasifs des personnes novices et des personnes expérimentées dans l'argumentation afin de mieux comprendre la différence entre ces deux formes de discours à différents niveaux d'expertise argumentative. Nos résultats confirment les distinctions théoriques entre délibération et persuasion. Les résultats suggèrent également qu'une plus grande expérience de l'argumentation est associée à un éventail plus riche d'objectifs argumentatifs, produisant un dialogue plus cohérent, intersubjectif et dialectiquement pertinent. On discute des implications de ces résultats pour l'apprentissage.

Keywords: deliberation, persuasion, critical dialogue, arguing to learn

1. Introduction

In recent years, educational researchers have turned their attention to argumentative dialogue as a vehicle for learning in school. When students argue, they engage in a form of elaborative questioning, prompting partners to clarify claims, cite evidence and justify conclusions; they may also challenge each other's reasoning with counter-claims and counter-evidence that support alternative points of view (Felton, Garcia-Mila, Villarroel and Gilabert 2015; Reznitskaya and Wilkinson 2017). These processes encourage students to make their thinking explicit, to respond to critical questioning, and to augment, revise or even replace knowledge with more accurate, nuanced or complex representations of the content under discussion (Andriessen 2006; Iordanou, Kuhn, Matos, Shi and Hemberger 2019; Osbourne 2010; Weinberger and Fischer 2006).

The potential benefits of argumentation for learning are well documented in the extant literature. First, argumentation can promote knowledge-building (Leitão 2000). When students argue with peers in dialogue, they prompt one another to explain not only what they believe to be true, but also why. This exploratory engagement encourages students to make sense of each other's thinking and articulate the evidence undergirding their understanding in a way that simple recitation of knowledge does not (Berland and Resier 2009). Second, argumentation can produce cognitive conflict, opening students' ideas up for critical questioning. When students argue, they must consider their views against those of their peers, prompting a reckoning that can uncover inaccurate or incomplete representations of knowledge (Asterhan and Schwarz 2009). This critical engagement drives students to identify gaps, inconsistencies or misconceptions in prior knowledge that can open the door to learning (Nussbaum and Sinatra 2003). Third, argumentation can drive students to reconstruct their representations of knowledge as they integrate the valid claims and evidence that emerge during discussion. This reconstructive engagement prompts students to co-construct new knowledge by coalescing their views and reconciling apparent contradictions in valid claims and evidence (Leitão 2000, Nussbaum and Edwards 2011).

However, the conditions required to realize the educative potential of argumentation are complex, particularly among inexperienced arguers. The kind of active engagement that promotes the explanation, critique and reconstruction of knowledge involves a combination of factors including not only the strength and coherence of the learner's prior knowledge in explaining a phenomenon, but also their commitment to it (Dole and Sinatra 1998). While argumentative dialogue can prompt students to collaboratively test the strength and coherence of their ideas, it can also have the opposite effect, triggering cognitive biases that increase their commitment to their prior knowledge in ways that undermine learning (Felton, Crowell and Liu 2015; Felton, Garcia-Mila, Villarroel and Gilabert 2015; Nussbaum and Edwards 2011). Speakers must actively avoid these biases if they are to fully leverage the educative potential of argument. For example, in the case of confirmation bias (Nickerson 1998), a student must set aside the tendency to devalue valid evidence that supports an opposing position in order to consider whether this evidence can be accounted for in their own understanding of a phenomenon. Careful consideration of the evidence may then lead them to moderate their views, adapt their conclusions, or abandon their knowledge construction altogether.

1.1. Deliberative dialogue and its potential for learning

Educational research into one particular form of argumentation, deliberative dialogue, has linked this collaborative, consensus-based form of reasoning to greater learning outcomes when compared to persuasive dialogue (Asterhan and Schwarz 2016; Felton, Garcia-Mila and Gilabert 2009; Berland and Lee 2012; Nussbaum 2008). According to Walton (2010), deliberative dialogue can be distinguished from persuasive dialogue by its goals. While speakers may hold divergent views in either context, in persuasive dialogue, they advance arguments in the interest of *defending* a conclusion, whereas in deliberative dialogue they advance arguments in the interest of *arriving at* a conclusion based on weighing arguments on either side. This distinction is of particular interest for educational researchers who study the potential of argumentation for learning. Research suggests that in persuasive dialogue,

speakers often look to neutralize, dismiss, or ignore alternative views when defending their position (Felton, Garcia-Mila, Villarroel and Gilabert 2015) in order to win or perhaps to save face in an argument (Asterhan 2013). It can also lead speakers to disengage with opposing-side arguments (Lao and Kuhn 2002), to overlook valid critiques of their own arguments, or select weak opposing claims to critique (Fischer and Greitemeyer 2010). In deliberative dialogue, on the other hand, speakers will critique opposing claims, but they may also choose to adapt their arguments, to concede or to integrate legitimate alternative claims in arriving at a conclusion. Because speakers are seeking to arrive at a conclusion when deliberating, they are more apt to entertain opposing positions and the impact of these views on their reasoning in the interest of finding the best solution (Felton, Garcia-Mila, Villarroel and Gilabert 2015).

Referencing work by McBurney, Hitchcock and Parsons (2007), Walton, Toniolo and Norman (2020) present a three-stage model of deliberation: (1) an opening stage in which participants establish the question, propose answers to discuss, and establish what types of evidence will be brought to bear; (2) an argumentation stage in which participants advance opposing claims and evidence in support of competing proposals, revising their arguments, as needed, through argument-counterargument integration (Leitão 2000; Nussbaum and Edwards 2011); and (3) a closing stage, in which consensus is sought and the dialogue is brought to an end (Walton, Toniolo and Norman 2020). However, Walton and colleagues (2020) suggest augmenting this model with an additional process related to information-seeking, wherein speakers exchange new knowledge germane to the problem and adjust their arguments in light of the additional information. They go on to suggest that the educational potential of argumentative dialogue lies in this iterative process of exchanging information and revising one's understanding of the problem space in ways that inform and expand the array of possible solutions (Walton, et al. 2020). Although all of the processes outlined in the argumentation stage can emerge in either persuasive or deliberative dialogue, in the latter speakers are inclined to coalesce arguments in the closing stage even when they cannot reach consensus. In addition, studies

have shown that persuasion goals can often trigger cognitive biases that undermine argumentative reasoning in both laboratory and classroom settings (Felton, Crowell and Liu 2015; Felton, Garcia-Mila, Villarroel and Gilabert 2015; Ferretti, MacArthur, and Dowdy 2000; Kuhn and Lao 1996; Nussbaum, Kardash and Graham 2005; Wolfe and Britt 2008). While speakers certainly advance and critique arguments, cognitive biases can lead speakers to avoid revising or adapting arguments despite valid critiques. Furthermore, some research on adolescent reasoning suggests that deliberation and persuasion dialogue may differ not only in the closing phase, but also in the argumentation and revise phase. These studies, which elicit deliberation with consensus goals (see Walton 2010), have documented the positive effects of consensus goals on the quality of argumentative reasoning when compared to persuasion goals. In one such comparison, Felton and colleagues (2009) ran a study with middle school science students and found evidence of better learning and critical reasoning in the deliberation group.

In a later paper, they performed a close analysis of discourse moves in each group (Felton, Garcia-Mila, Villarroel and Gilabert 2015) and found that participants in the deliberation condition were more likely to revise their own arguments in response to critiques from their partners than participants in the persuasion condition. They also engaged in longer exchanges around each claim, co-constructing arguments with their partners by offering additional claims to elaborate opposing viewpoints. Conversely, participants in the persuasion condition were more prone to disputative talk, competitively advancing claims and counterarguments, without responding to one another's arguments.

However, despite these promising findings, the extant research does not universally favor consensus-seeking dialogue. In another comparison of persuasion and deliberation conducted with undergraduates, Asterhan, Butler and Schwarz (2010) found that persuasion goals did lead to more competitive moves (e.g., devaluing a partner's contributions) and fewer collaborative moves (e.g., joint problem solving) in dialogue. However, they also found more instances of critical reasoning in the persuasion group, leading them to call for further research to understand how consensus goal

instructions affect the quality of reasoning. Similarly, Thiebach, Mayweg-Paus, and Jucks (2016) found that dialogue aimed at agreement around similarities in perspective can leave speakers prone to blindly accepting ideas without carefully assessing them. They point to the importance of focusing speakers' attention on differences in their perspectives to trigger critical dialogue and generative argumentation. Herein lies an important distinction: although deliberative argument aims at consensus, quick-consensus, where speakers prioritize agreement or face-saving over the careful analysis of alternative arguments (Asterhan 2013, Weinberger and Fischer 2006) may undermine the critical analysis of arguments, typically found in the argumentation and revise phase of deliberative dialogue. Thus, while the extant research on persuasive and deliberative dialogue has uncovered significant findings on the power of deliberative dialogue for learning, at least among adolescents and young adults, additional research is needed to better understand why and under what conditions it can be optimized for learning.

One promising way to revisit these contradictory findings in the literature is to look at dialectical relevance (Macagno 2018, Walton 2003), or the degree to which speakers take up joint activity in argumentative dialogue. Dialectical relevance can be understood as the use of three kinds of relevance in dialogue: (1) *topical relevance*, or adherence to the issue being discussed; (2) *probative relevance*, or the degree to which moves promote or challenge the acceptability of claims; and (3) *pragmatic relevance*, or the degree to which moves engage with or respond to moves made by others in the dialogue (Macagno 2018, Walton 2003). When individuals fully engage with each other's reasoning in these three ways, they naturally surface, critique and coalesce their collective arguments on a particular issue. In contrast, one thing that dispute and quick-consensus may share in common is a failure to maintain one or more of these types of relevance in dialogue.

1.2. *The present study*

Taken together, past studies suggest that under the right conditions, deliberative argument may be more likely to promote generative and collaborative reasoning than persuasive dialogue among

novice arguers. However, it is unclear how the goals of reaching consensus interact with specific argumentative moves and purposes in each phase of argumentative dialogue, particularly when it comes to dialogic moves that focus on critiquing arguments. Furthermore, none of the extant studies explores the role of experience in shaping argumentative discourse. Much of the empirical work to date, particularly in educational contexts, has looked at adolescent and young adult speakers. An analysis of argumentation among more experienced arguers might yield important insights into the more sophisticated use of dialogue to engage in argumentative reasoning across dialogue types.

In the present investigation, we look to extend the extant literature by comparing deliberative dialogue with persuasive dialogue among novice and experienced arguers. We ask whether more experienced arguers show the same differences between discourse conditions as novices do, and more broadly, we seek to understand how discourse unfolds in the hands of these more practiced arguers across dialogue types. Finally, we examine dialectical relevance (Macagno 2018) in each condition to better understand how this construct can help to inform our understanding of what it means to engage in productive argumentation.

Research questions:

1. What patterns of discourse emerge when we cross discourse goals (persuasion vs. deliberation) with level of experience (novice vs. experience) and what do these patterns tell us about the relationships between discourse goals and experience?
2. How does an analysis of dialectical relevance in these dialogues inform our understanding of argumentation as a joint activity?

2. Methods

2.1. Participants

Participants in the novice arguer (*Nov-Arguer*) group were 162 first-year college students (90 male, 72 female); participants in the experienced arguer (*Exp-Arguer*) group were 78 second- and third-year law students (47 male, 31 female) and 74 science PhD candidates (34 male, 40 female). The total sample size comprised 157 dyads engaged in argumentation, and when restricted to the smallest within-sample comparison (experience comparisons across conditions) differences were based on 72 dyads, a sample sufficient to draw comparisons across two groups.

The novice sample was enrolled in an introductory psychology course at a mid-size university in the American Midwest. Introductory psychology courses, such as Psychology 101, are often taken by freshmen students across university majors. Such courses often require participation in psychological research to fulfill course requirements, making students from these courses a convenience sample, but also a reasonable point of comparison when making inferences about undergraduate students.

Participants in the *Exp-Arguer* group were recruited from graduate programs in law and science at ten comparable universities in the American Midwest. Our rationale for using graduate students in law and science to comprise our *Exp-Arguer* group is three-fold. First, these students have self-selected to go into professions where argumentation plays a central role. Second, they have been selected into their programs by graduate admissions committees. Finally, all participants in the *Exp-Arguer* group have completed a bachelor's degree prior to engaging in graduate work making them an appropriate comparison group to those just beginning an undergraduate degree.

2.2. Procedure

Recruitment materials stated that individuals were needed to take part in an online chat to argue with a peer who disagrees with them about capital punishment (CP). Participants were asked to send an email with the answer to the following question: "Capital punish-

ment, also called the death penalty, is the practice of putting someone to death for committing a serious crime, like murder.

Are you for or against capital punishment?" Interested individuals emailed their opinion about CP and were then paired with the next available person from their group (ie, novice, lawyer, scientist) who held the opposing position.

Pairs were randomly assigned to either the consensus-dialogue condition or the persuasion-dialogue condition in order to discuss the issue as a way to prepare a written essay on the topic. Those in the consensus-dialogue condition were instructed to try to reach consensus with their partner while students in the persuasion-dialogue condition were instructed to try to persuade their partner to adopt their position. The goal-manipulation instructions were given twice, once at the beginning of the email and once at the end of the email to strengthen its impact.

2.3. Coding

To analyze the dialogues, we used an argumentative dialogue coding scheme originally developed for persuasive dialogue (Felton and Kuhn 2001) and later expanded to capture deliberative dialogue (Felton, Crowell, Garcia-Mila and Villarroel 2019) (see Appendix A). All data were blinded by a research assistant to remove any references to the participants' level of experience or discourse goals. The authors then double coded twelve percent of the dialogues to calculate inter-rater reliability (Cohen's Kappa = .87, sig < .001). Disagreements in coding were resolved by dialogue and the remaining data were then divided between the authors and coded for data analysis. It was decided that although the authors were not blind to the research questions, being blind to the conditions of the participants provided an acceptable safeguard against bias in coding, while ensuring accurate application of the coding scheme. While this decision introduces a limitation in the study, we have tried to mitigate this effect in the interest of ensuring that the data were coded accurately by the researchers who developed the coding scheme.

Deliberation Phase	Dialogic Purpose	Dialogic Move(s)
Opening Stage		
	<i>Establishing the question, goals and limits of dialogue.</i>	<i>N/A</i>
	<i>Initiating dialogue.</i>	<i>Position, Position?</i>
Argumentation Stage		
	<i>Making claims.</i>	<i>Counter-A, Argument.</i>
	<i>Securing commitments from partner.</i>	<i>Stance? Case? Initiate, Case.</i>
	<i>Inviting elaboration of arguments.</i>	<i>Justify? Substantiate? Clarify?</i>
	<i>Representing partner's argument.</i>	<i>Interpret.</i>
	<i>Critically evaluating arguments.</i>	<i>Counter-C, Rebut.</i>
	<i>Co-constructing arguments.</i>	<i>Add, Advance, Add-substantiate, Anticipate.</i>
	<i>Setting bounds to discussion.</i>	<i>Framing.</i>
	<i>Revising arguments.</i>	<i>Accommodate, Concede.</i>
	<i>Withdrawing arguments.</i>	<i>Withdraw.</i>
Closing stage		
	<i>Reviewing progress in argument.</i>	<i>Recap.</i>
	<i>Reaching consensus.</i>	<i>Position-Qualification, Accept, Reject.</i>

Table 1. Dialogic moves associated with the purposes and phases of deliberative argument.

Codes for dialogic moves (Table 1) were then combined into theory-driven categories of argumentative purposes (Felton, Crowell, Garcia-Mila and Villarroel 2019), aligned to the three stages of deliberative dialogue outlined by Walton, Toniolo and Norman (2020). Approximately 58% (26 of 45) of the moves from the argumentative dialogue coding scheme apply directly to these argumentative purposes, resulting in the 13 categories seen in Table 1. (The 19 categories of dialogic moves not included in Table 1 were not germane to our research questions and were therefore excluded from our statistical analysis. For a full list of codes, see Appendix A.) These moves and purposes were then applied to both the persuasive and deliberative dialogues, since the

two discourse goals differ only in the closing phase (Walton et al. 2020).

3. Results

3.1. Quantitative analysis

Quantitative analysis of the dialogue data allows us to see if there are structural differences that rise above the level of chance that can be attributed to the level of experience, discourse goal, or an interaction of the two. To account for variability in the lengths of the dialogues, we calculated proportions of the total dialogue moves that were coded as a particular category.

For each dialogue, proportional use of each of the 13 categories of dialogic purpose was calculated by dividing the occurrence of each by the total number of coded utterances in that dialogue. These distributions were then arcsine transformed (as is appropriate for values close to zero) and tested for skew. Codes with skew between -2 to +2 were included in the analysis (George and Mallery 2010) as this indicates that that the data is fairly normal, and the basic assumption of parametric testing are met. The categories that were excluded from analysis were: *initiating dialogue*, *setting bounds to discussion*, *co-constructing argument*, and *withdrawing arguments*. This resulted in the nine analyzable categories of argumentative purposes. Table 2 presents the proportional use for each of these nine categories by condition.

Argumentative Purpose	Dialogue Condition	Exp-Arguer Condition			Nov-Arguer Condition		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>Critically Evaluating Arguments</i>	Deliberation	37	0.17	0.11	40	0.21	0.2
	Persuasion	35	0.22	0.13	41	0.29	0.1
<i>Making claims</i>	Deliberation	37	0.03	0.04	40	0.04	0.1
	Persuasion	35	0.02	0.03	41	0.08	0.1
<i>Inviting elaboration</i>	Deliberation	37	0.04	0.04	40	0.03	0
	Persuasion	35	0.04	0.03	41	0.03	0
<i>Securing commitments</i>	Deliberation	37	0.05	0.04	40	0.02	0
	Persuasion	35	0.05	0.04	41	0.04	0
<i>Revising arguments</i>	Deliberation	37	0.08	0.05	40	0.08	0.1
	Persuasion	35	0.08	0.04	41	0.08	0.1
<i>Reaching consensus</i>	Deliberation	37	0.07	0.06	40	0.06	0.1
	Persuasion	35	0.02	0.02	41	0.02	0
<i>Representing partner's argument</i>	Deliberation	37	0.03	0.02	40	0.01	0
	Persuasion	35	0.02	0.02	41	0.01	0
<i>Reviewing progress</i>	Deliberation	37	0.02	0.02	40	0.02	0
	Persuasion	35	0.01	0.02	41	0.01	0

Table 2. Proportional use of argumentative purposes by condition.

A two-way factorial (Experience x Argumentative Goal) ANOVA was then used to test the effect of each factor in the presence of the other factor for every category of dialogic purpose. Overall, one significant interaction effect was found for the category of *making claims*, $F(3,149) = 6.63$, $p = .01$, $R^2 = .15$. Novice arguers utilized this move more frequently in the persuasion condition than they did in the deliberative condition while experts utilized the move with about equal frequency in the two argumentative goal conditions, a degree that is roughly on par with the level of novices in the deliberative condition (Figure 1).

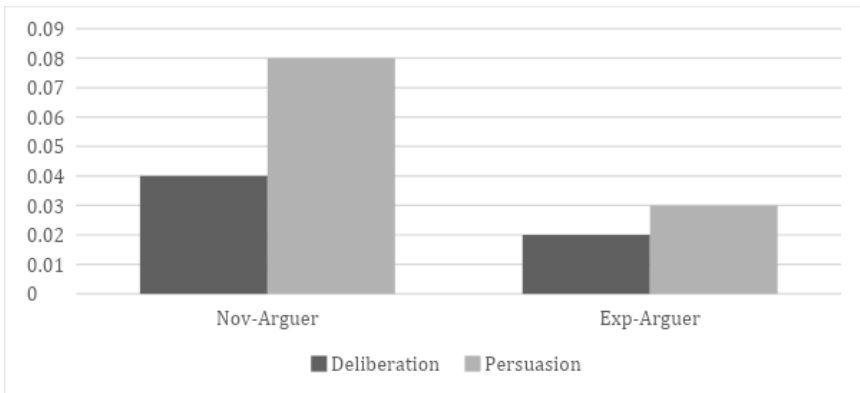


Figure 1. Interaction effect for proportional use of making claims

In addition, several key main effects for argumentative experience were found in our data with experienced arguers being more likely than novices to engage in *inviting elaboration of arguments* (*Justify?*, *Clarify?*, *Substantiate?*), $F(3, 149) = 4.76, p < .05$, *securing commitments* (*Stance?*, *Case?*, *Initiate, Case*), $F(3, 149) = 8.77, p < .01$ and *representing partner's argument* (*Interpret*), $F(3, 149) = 14.81, p < .01$. Novice arguers, on the other hand, were more likely to engage in *critically evaluating arguments* (*Counter-critique*) than experts $F(3, 149) = 7.46, p < .01$.

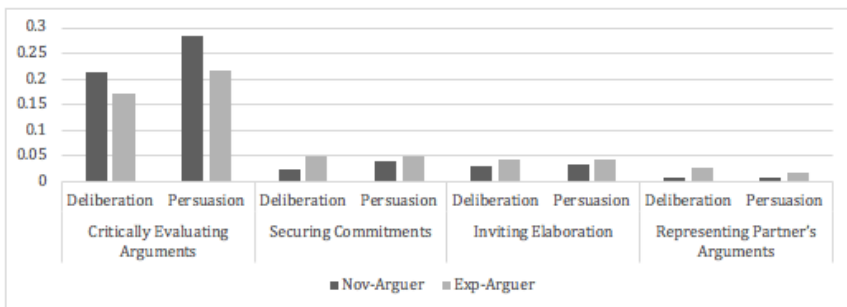


Figure 2: Main effects for experience

There were also significant differences across argumentative goal conditions, with the categories of *reviewing progress in the argument* (*Recap*) $F(3, 149) = 8.02, p < .01$ and *reaching consensus* (*Position-qualification, Accept, reject*) $F(3, 149) = 36.96, p < .01$ occurring more frequently in the deliberative condition than the persuasive condition. These were the two argumentative

purposes that comprise the closing phase of deliberative dialogue and distinguish it from persuasive dialogue.

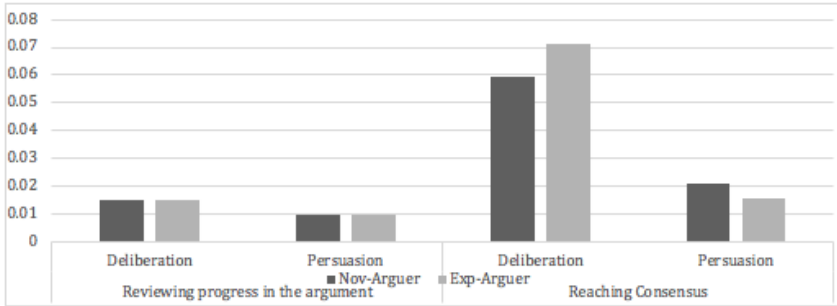


Figure 3: Main effects for discourse goals

3.2. Qualitative analysis of data

In this section we present sample data from each condition to illustrate our quantitative findings and consider the role of dialectical relevance in creating a sense of cohesion in participants’ argumentative dialogues. Here, we analyze data for the three types of dialectical relevance (*topical*, *probative* and *pragmatic*). Following Macagno (2018), we recognize that judging relevance requires considering moves in the context of the broader sequence in which it appears. For this reason, we consider how particular moves function not only locally, in relationship to other moves, but also globally in terms of its argumentative purpose in the dialogue as a whole.

Line	Speaker	Utterance	Code(s)
5	Paul	<i>What about DNA evidence? Do you think that can come into question?</i>	Stance-?
6	Carli	<i>I think DNA evidence is a good, but imperfect measurement.</i>	Stance
7	Paul	<i>Why imperfect?</i>	Clarify-?
8	Carli	<i>Well, do you want technical info?</i>	Meta-?
9	Paul	<i>If you had an example that might be helpful!</i>	Meta

10	Carli	<i>It's usually based on mitochondrial DNA which is different than genomic DNA, the difference being that genomic is very identifying and mitochondrial is more general. You could say it came from this family...</i>	Clarify
11	Paul	<i>Interesting. I thought it was genomic.</i>	Acknowledge
12	Carli	<i>...but genomic DNA isn't as stable and it's much messier...</i>	Continue
13	Paul	<i>I think this could be a good area where we could come to an agreement. [:] That definitely changes my opinion about the DNA testing.</i>	Meta [:] Concede
14	Carli	<i>...It's still evidence, it's just not as concrete.</i>	Continue
15	Paul	<i>So I think we both agree that with lots of corroborating witnesses/video evidence we can say for sure what happened and who committed a violent crime. [:] Am I right?</i>	Recap [:] Accept?
16	Carli	<i>Yes</i>	Accept
17	Paul	<i>In a case like that are you still against capital punishment?</i>	Stance-?
18	Carli	<i>Yes, because it's just an ancient barbaric practice. I consider it at the level of slavery. I just don't condone it, that's not how people are treated. No matter who it is there needs to be a base level of how to treat another human and capital punishment goes below that level, as does murder of any kind.</i>	Stance
19	Paul	<i>So, if murder goes below that level, that still requires us to treat the person above that level?</i>	Stance-?
20	Carli	<i>Absolutely, because we as a whole should be better than murderers.</i>	Stance
21	Paul	<i>I would agree with that. [:] I think I could agree to change my opinion if there was some guarantee that a person couldn't get out on parole or anything if they were not acquitted.</i>	Concede [:] P-Q-1
22	Carli	<i>I know what you're saying. [:] Do you think a person can change after many years?</i>	Acknowledge [:] Stance-?
23	Paul	<i>I think they can, [:] but I think murder goes so below where we should be in society...</i>	Stance [:] Counter-A
24	Carli	<i>That's fair.</i>	Acknowledge
25	Paul	<i>...we give so many second, third, fourth chances in our justice system. I just don't think murder should be included in that.</i>	Continue
26	Carli	<i>It would be pretty horrible to be "rehabilitated" and stuck to rot in prison.</i>	Counter-C
27	Paul	<i>How can one prove that they are "rehabilitated" though?</i>	Counter-C

28	Carli	<i>We can't, [:] but I'm willing to believe that it can, but I have no problem letting a killer stand around in prison either way.</i>	Concede [:] P-Q-2
28	Paul	<i>So, do you think it's OK to let a killer go ever (of course unless they are acquitted)?</i>	Clarify-?
30	Carli	<i>No, I'm happy enough to let them stay in prison and I think that most violent killers don't actually get paroled from their life sentences.</i>	Clarify
31	Paul	<i>Ok, I could agree to ending capital punishment if there is a guarantee that violent offenders will not have a chance to get out.</i>	Recap

Table 3. Sample Dialogue from the Exp-Arguer x Deliberative Condition

In the first excerpt, taken from the *Exp-Arguer x Deliberation* condition (Table 3), we see that the two speakers closely engage with each other's thinking, *inviting elaborations* (*Clarify-?*, lines 7 and 28) and *securing commitments* (*Stance-?*, lines 5, 17, 19 and 22) regarding DNA evidence (lines 5-14), societal ethics (lines 15-20) and rehabilitation (lines 21-30), in order to *review arguments* (*Recap*, lines 15 and 31) and *reach consensus* (*P-Q, Accept*, lines 15-16, 21, and 28). More broadly, the two speakers maintain topical relevance throughout by limiting their dialogue to capital punishment. They also maintain probative relevance through a series of questions and answers aimed at testing the grounds and limits of each other's commitments. For example, in lines 5-14, Paul (all names are pseudonyms) elicits Carli's stance on the certainty of DNA evidence. Carli responds by explaining that mitochondrial DNA is imprecise, and Paul concedes the point on line 13. Significantly, we see a probative examination from Paul that surfaces the grounds for Carli's stance and leads Paul to cede ground and adopt a commitment for the opposing side. This dialectical shift to information-seeking dialogue, demonstrates the way in which speakers can maintain dialectical relevance in an exchange even as the local aims of a dialogue change (per Walton et al. 2020). A similar probative exchange, this time about rehabilitation, occurs on lines 22-28, with Carli ceding ground this time. As we can see, although there is only limited use of *counter-argument* moves in the excerpt (lines 26-27), exchanges like this illustrate the way in which critical questioning can be used for probative aims. Finally, throughout the exchange, the two speakers

also maintain pragmatic relevance in an uninterrupted series of questions, answers, meta-dialogue, and statements all produced in the service of collaboratively surfacing, probing and reconciling arguments.

Line	Speaker	Utterance	Code(s)
8	Talia	<i>My other main concern about the death penalty is that I think that death is doled out unfairly--poor people and people of racial minorities are killed much more often than [sic] rich people. Can we ensure this is because they commit more crimes? To what extent is this due to the fact that they can't afford costly attorneys--or that they are a product of circumstances in which they were placed in society?</i>	Counter-C
9	Yasmin	<i>Maybe it is a legislative issue in which certain threshold tests must be met to even consider placing individuals on death row. And, as I mentioned earlier, my personal belief is that only those who we are certain committed the crime should face the death penalty. This may remedy the appeals costs if there is positive DNA evidence or self-admission.</i>	Accommodate
10	Talia	<i>What I struggle with is how much responsibility to place on people that commit heinous crimes. [:] To your point, would you limit the death penalty to murders?</i>	Argument [:] Clarify-?
12	Yasmin	<i>I'm slightly torn on that. Definitely violent crimes, but where to draw the line is difficult. I think murder would be easy to justify. Other violent crimes would be harder to justify because it could not be a bright line test.</i>	Clarify
13	Talia	<i>What do you see as the purpose of killing people who commit murders?</i>	Stance-?
14	Yasmin	<i>Purely punishment. Possibly deterrence for others. [:] I definitely think that capital punishment is something that should be HIGHLY regulated, but it is justified in the proper circumstances</i>	Stance [:] Accommodate
15	Talia	<i>See, my thought would be that "death penalty" v "jail for life without possibility of parole" isn't much of a deterrent. It seems unlikely criminals would make a distinction between the two.</i>	Counter-C
16	Yasmin	<i>So, do you think both options are inefficient? or are you saying there isn't a big enough difference?</i>	Clarify-?
17	Talia	<i>I think there's no extra deterrent to criminal behavior by the fact that the death penalty exists. I don't think crimes would be committed in non death penalty states that wouldn't be committed in death penalty states. [:] I agree with you that the standard should be very high, [:] but ultimately, I feel like the state shouldn't be involved in determining who lives and dies. I think extinguishing life is criminal, whether you are extinguishing the life of an innocent victim or a hardened criminal</i>	Clarify [:] Agree [:] Argument

Table 4. Sample dialogue from the Exp-Arguer x Persuasion condition

The next excerpt (Table 4) is taken from the *Exp-Arguer x Persuasion* condition. Like the speakers in the previous excerpt, Yasmin and Talia use lines of questioning to *invite elaboration* (*Clarify-?*, lines 10 and 16) and *secure commitments* (*Stance-?*, line 13), in this case to discuss issues of inequity, certainty, and deterrence. Only one argument, regarding the culpability of criminals (line 10) is dropped, but without digression from the topic. Thus, we again see a high degree of topical relevance maintained throughout the exchange. We also see probative relevance as the two speakers *secure commitments* (line 13) and *critique their partner's reasoning* (lines 8 and 15). For example, Yasmin presses Talia with an argument about inequity in the justice system (lines 8-9) and deterrence (line 13-17). In both cases, Yasmin *revises arguments* (*Accommodate*, lines 9 and 14) in response to valid points made by Talia, a sort of parallel to the position qualifications observed in the *Exp-A x Deliberation* condition. In other words, although Yasmin aims to persuade Talia, she also remains open to adjusting her arguments in response to opposing argument. Finally, in terms of pragmatic relevance, the two maintain a high degree of coherence by asking and answering pertinent questions in the service of engaging with each other's thinking. Indeed, the coordination of argumentative purposes (*inviting elaboration*, *securing commitments*, and *critiquing reasoning*) signal a genuine attempt on the part of each speaker to actively engage their partners in a joint activity.

Line	Speaker	Utterance	Code(s)
3	Darius	<i>Well when it comes to innocent people being wrongly accused, I definitely believe that they shouldn't be executed. [:] However, I don't believe that wrongly accused people are ever executed because of the extensive legal processes necessary to carry out an execution.</i>	Acknowledge [:] Counter-C

4	Chloe	<i>There was one particular case around 2004 where a man in Texas was executed upon the belief that he killed his children in a fire. It was believed that he set the fire to cover up abuse on the children, but later on investigators agreed that there was no scientific evidence that a crime had taken place. [:] Also, a lot of time when people are put on death row, they are being defended by the worst paid, least skillful lawyers. So that could effect [sic]the case largely.</i>	Counter-C [:] Counter-C
5	Darius	<i>If there was not conclusive evidence, the man would not have been executed. I don't believe they would have executed him without the proper scientific evidence. [:] However, I do know that of almost all states, Texas executes the most people therefore the process could have been rushed and a mistake could have been made. This does still not change my view. [:] If somebody is put on death row, they committed a crime worthy of them being put to death. [:] Justice must be served as equally as possible. If somebody killed a loved one of mine, I certainly would want them to be put on death row because thats the only thing that would be fair. [:] If we did not have the death penalty, criminals would be less afraid of committing crimes worthy of the death penalty</i>	Counter-C [:] Accommodate Continue [:] Argument [:] Argument
6	Chloe	<i>I agree with that statement. Yes, criminals would be less afraid. [:] But I think life imprisonment is just as bad. For one thing, there is no evidence that the death penalty lowers the murder rate more than the threat of life imprisonment. [:] Also, when criminals must serve a life imprisoned in jail some may take that time to think about their crimes and realize their wrongdoings. I realize that this is a slim chance. But life in prison is hardly a life at all, and to me serves as a worthy punishment. [:] Also, life imprisonment costs much less than an execution.</i>	Concede [:] Counter-C [:] Counter-C [:] Counter-C [:] Argument
7	Darius	<i>I still don't believe that life in prison serves as justice for a murder. It is not equal, therefore it is not equal justice</i>	Counter-C
8	Chloe	<i>The "eye for an eye" thinking is based on biblical teachings. This is the main reason that we have the death penalty in the US. [:] However, we must take into consideration that not everyone living in America follows the teachings of the Bible, or follows any organized religious teachings at all.</i>	Interpret [:] Counter-C
9	Darius	<i>Apart from anyone's morals, it is common sense that if someone kills somebody, they deserve an equal punishment [:] I try to put myself in a situation where someone murders somebody close to me. There is no doubt in my mind that I would want that person to face the same fate.</i>	Counter-C [:] Argument
10	Chloe	<i>That just seems hypocritical to me. [:] But I do agree that if someone would murder someone close to me I would be enraged. [:] Though, maybe I would feel just as good if they were put in jail for life,</i>	Counter-C [:] Concede [:] Counter-C
12	Darius	<i>We need to agree on a policy regarding capital punishment that we would recommend [:] I feel that it should be used if, and only if, there is 100% conclusive evidence that a crime occurred and [:] that it should only be used for murders</i>	Meta [:] P-Q-1[:] P-Q-2
13	Chloe	<i>I agree that there should absolutely be 100% conclusive evidence and that murders should be the only case that it is used for. [:] And I agree that many people will not feel settled unless they know the one who killed their loved one is dead.</i>	Accept [:] Agree [:] P-Q-2

Table 5. Sample dialogue from the Nov-Arguer x Deliberation condition

In Table 5, we see a typical exchange from the *Nov-Arguer x Deliberation* condition. As with the experienced arguers, we see a high degree of topical relevance. What is different is the way in which the speakers engage with each other's reasoning. Darius and Chloe spend much of their time *making claims* (*Argument*, lines 5, 6 and 9) and *critically evaluating arguments* (*Counter-C*, lines 3-10), cycling through the process of introducing and evaluating new arguments at a much higher rate than experienced arguers. Though probative relevance is high, these novice arguers showed significantly less range in their argumentative purposes, spending less time *inviting elaborations* and *securing commitments* than more experienced arguers. They spend less time developing intersubjectivity, the common ground from which to develop consensus. Nonetheless, they do manage to *revise arguments* (line 5), *review progress* and *reach consensus* (lines 12-13), enacting the purposes that typically characterize deliberative dialogue. And, like the experienced arguers, they maintain a high degree of pragmatic relevance, clearly engaging with each other's thinking throughout.

Line	Speaker	Utterance	Code(s)
4	Elise	<i>Well I feel that if a person takes another's life, they shouldn't have the right to have their own.</i>	Argument
5	Lorena	<i>Yes, but what authority do you have to determine who lives or dies? Isn't it a little bold to state that you or those you elect should hold the power of determining life or death?</i>	Counter-C
6	Elise	<i>This may be a poor analogy but to me it's like the golden rule...do to others as you would like to be treated. I don't think that whoever "they" is are the people who determine this. Doing something so terrible as taking another person's innocent life is deciding for yourself. [:] And I just don't feel that our jail system does justice to these level of crimes.</i>	Rebut [:] Argument
7	Lorena	<i>But using that analogy, I would like to live, and if I were to treat others like I would like to be treated, would I not even let the suspect of the crime live? [:] Besides, the death penalty doesn't work and is costly. It costs more to kill a person than to keep them in life for prison.</i>	Coopt [:] Argument
8	Elise	<i>That gives no justice to the victim's families who have suffered so much. [:] Jails have so many luxuries these days that it is absolutely ridiculous. [:] And there must be a serious punishment to deter others from committing such a crime.</i>	Counter-A [:] Argument [:] Argument

9	Lorena	<i>"An eye for an eye makes the world blind" etc. I don't see how killing those who kill people manages to show people that killing people is bad. [-] Moreover, DNA evidence has shown that often the wrong person is killed, so how can justice be brought if those facts are shown light? [-] By imposing the death penalty, the due process of law is disregarded.</i>	Counter-A [:] Argument [:] Argument
10	Elise	<i>Well first of all, it brings closure to the family. These cases can go on for years and years and to finally have some sort of closure and knowing that the person who caused so much pain to a family is finally put in his/her place is the least the family and innocent victim can receive. [-] As for the deterrent you can say that killing people who kill doesn't show that it's bad but just look at statistics and clearly it has some effect on people. The rates of unlawful killings in Britain has more than doubled since capital punishment has been abolished. Also, there was a clear drop in the number of murders in 1983, the year after the first man was executed by lethal injection in America.</i>	Counter-A [:] Counter-C
11	Lorena	<i>Britain also has removed its people from owning any sort of firearms and even their police are no longer equipped, so I think that argument is an entirely different story</i>	Counter-C

Table 6. Sample dialogue from the Nov-Arguer x Persuasion condition

The argumentative exchange in Table 6, illustrates a defining feature observed in the Nov-Arguer x Persuasion condition. The speakers spend the majority of their time *making claims* (*Argument, Counter-A*). Certainly, they maintain a high degree of topical relevance throughout. As with the other three conditions, the entire exchange focuses on claims pertinent to capital punishment. Lorena and Elise also maintain in a reasonably high degree of probative relevance, as a number of turns involve *critically evaluating arguments* (*Counter-C, Rebut*, lines 5, 6, 10 and 11). However, when it comes to pragmatic relevance, we see a phenomenon not typically observed in the other three conditions. The presence of *Counter-A* moves (lines 8, 9 and 10) indicates disjuncture, or breaks in the transactive exchange where speakers introduce a new claim, rather than address their partner's point. Thus, like the Nov-Arguer x Deliberation, we see little diversity in the argumentative purposes pursued by the two speakers. In addition, in this condition, although we see a similar set of argumentative purposes at play (*making claims, critically evaluating arguments*), the flip in proportion of these two purposes indicates a lower degree of transactive dialogue, pragmatic relevance, and more broadly, joint activity. This phenomenon is what Macagno (2018) refers to as

dialogue clashes, or breakdowns in joint communication where speakers pursue divergent, incompatible aims and argue at cross purposes.

4. Discussion

4.1. Argumentative purpose, dialectical relevance and argumentative competence

In the present study, we sought to better understand the nature of persuasive and deliberative dialogue by studying the two discourse goals crossed with two levels of experience. Specifically, we asked: (1) What patterns of discourse emerge when we cross discourse goals (persuasion vs. deliberation) with level of experience (novice vs. experience) and what do these patterns tell us about the relationships between discourse goals and experience? And (2) how might an analysis of dialectical relevance in these dialogues inform our understanding of argumentation as a joint activity?

To the first research question, we found two main effects for discourse goal. Across our two levels of experience, participants in the deliberation condition were more likely than those in the persuasion condition to review progress and reach consensus, argumentative purposes characteristic of the *revise phase* of deliberation dialogue outlined by Walton, Toniolo and Norman (2020). This finding supports theoretical models of argumentation that propose that the two discourse goals differ primarily in the closure phase of argumentation (Walton et al. 2020) and replicate similar findings among adolescents (Felton, Garcia-Mila, Villarroel and Gilabert 2015) with an older and more experienced group of arguers. They also point to the power of deliberative dialogue to elicit the kind of reconstructive engagement associated with learning outcomes.

We also found several main effects for experience. Experienced arguers were more likely than novices to represent their partners argument, invite elaboration of that argument and seek and secure commitments from their partner. These argumentative purposes, which align with the potential for exploratory engagement in learning, illustrate that experienced arguers were more adept than novices at drawing on a wide array of argumentative purposes in

an effort to develop intersubjectivity while arguing. Experienced arguers across both conditions treated argumentative dialogue as a cooperative activity regardless of whether they sought to persuade one another or reach consensus, working together to understand and critique each other's arguments. These findings suggest that experienced arguers may share a set of assumptions about dialectical relevance in argumentation as whole, worthy of further study. Similarly, further research into novice arguers' assumptions about dialectical relevance particularly as it relates to argumentation as a collaborative enterprise, may uncover valuable insights into trajectories in learning to argue.

Novices, on the other hand, often argued at cross purposes, switching topics frequently to either out-manuever or overwhelm opponents rather than engage with them, especially when seeking to persuade. Novices in both conditions were also more likely to critically evaluate their partners' arguments. However, while it might be tempting to conclude that novices are somehow more inclined to engage in critical discourse, it is important to note that counter-argument (*Counter-C*) represented the highest-proportion move in all four groups. In other words, even though counter-argument occurs significantly more frequently among novices, experienced arguers made ample use of this discourse move across dialogue conditions. Instead, it might be more accurate to conclude that more experienced arguers were more likely to coordinate the critical evaluation of argument with a host of other argumentative purposes, thereby spending less time pursuing this one purpose overall. Indeed, some argumentative purposes, like inviting elaborations, may sometimes involve critical engagement with a partner's argument, as seen in our qualitative data from the *Exp-Arguer x Deliberation* condition. Together, these findings suggest that more experienced arguers engage in a richer, more collaborative process of critical reasoning that cannot be reduced to a mere frequency count of counter-arguments. Experienced arguers *balance* exploratory-, critical- and reconstructive engagement when speaking, suggesting that their dialogue may be more conducive the leveraging the educational potential of argumentation. These findings may shed new light on the relationship between critical evaluation of claims and deliberative dialogue, helping to untangle

mixed findings in the extant literature (Asterhan Butler, and Schwarz 2010; Felton, Garcia-Mila, Villarroel and Gilabert 2015; Theibach, Mayweg-Paus and Jucks 2016). It suggests that at least among novice arguers, deliberative dialogue may elicit argumentative moves that balance efforts at exploratory, critical and reconstructive engagement. We suggest that further research—utilizing more complex constructs for capturing types of engagement in argumentative dialogue—is warranted.

Finally, our quantitative analysis revealed one interaction effect. Novice arguers in the persuasive dialogue condition were more likely than all other groups to advance claims while arguing, favoring breadth over depth when advancing their position. This finding suggests that novice arguers in the persuasion condition were more likely to break transactive dialogue in order to present a new, unrelated claim. In building a bulwark of claims, counter-claims and rebuttals, novice arguers in the persuasion condition seem to favor the strategy of dominating the conversation. Ironically, this impulse undermines each speaker's ability to build a persuasive argument by carefully addressing and incorporating their partner's beliefs and commitments. In the end, their discourse more closely resembles a quarrel, or what Walton (2010) calls *eristic dialogue*, than the persuasive dialogue of the expert group, and less likely to promoting the kinds of active engagement associated with learning.

To address our second research question, we applied the concepts of topical, probative, and pragmatic relevance to a small sample of data. A qualitative analysis of dialectical relevance in our data revealed a phenomenon not readily apparent in the quantitative analysis of argumentative purposes: when speakers engage with each other's thinking, they maintain a high degree of probative and pragmatic relevance, producing longer lines of connected discourse. When experienced arguers elicit thinking, secure commitments, represent arguments or critically evaluate claims, they also demonstrate a high degree of joint activity (Macagno 2018), attending to one another's thinking in extended sequences of collaborative dialogue. And while novices seeking consensus draw on a more limited array of argumentative purposes, they nonetheless resemble experienced arguers by maintaining pragmatic rele-

vance in dialogue. This additional layer of analysis uncovers an important convergence in our findings. In drawing on a wider array of argumentative purposes, these arguers are producing more dialectically relevant dialogue. They are engaging more directly with each other's thinking, in more extended lines of reasoning, to produce the kind of joint, co-constructive activity that is associated with the potential benefits of argumentation for learning.

In contrast, when arguing to persuade, novices produce fewer transactive moves (Felton and Kuhn 2001) and instead draw on the sub-optimal strategy of arguing at cross-purposes, building their argument at the expense of addressing their partner's reasoning. They argue with divergent discourse aims and produce less dialectically relevant discourse, producing divergent monologues, rather than taking up the convergent aim of trying to build a convincing argument from their partner's commitments (Walton 2001). Taken together, our findings suggest that the benefits of deliberative argument may lie in increasing dialectic relevance, widening the scope of argumentative purposes to include exploratory, critical and reconstructive engagement between speakers.

Of course, our findings do not include data on learning, so these connections are tentative for the moment. However, we believe that they may provide insight into past findings regarding the benefits of deliberative dialogue among adolescents (Felton, Garcia-Mila, Villarroel and Gilabert, 2015) and young adults (Asterhan, Butler and Schwarz 2010; Felton, Crowell and Liu 2015), while also explaining why deliberative dialogue can sometimes undermine critical engagement (Thiebach, Mayweg-Paus and Jucks 2016). Further research is necessary to test these connections explicitly in the context of a learning task.

4.2. Educational implications: Leveraging the potential of argumentative discourse for learning

To summarize, our findings suggest that when they argue to persuade, novices are less likely to produce transactive and pragmatically relevant utterances than they do when they argue to deliberate, consistent with the extant literature (Felton, Garcia-Mila, Villarroel and Gilabert, 2015). Furthermore, novices as a whole,

draw on a narrower array of argumentative purposes while arguing. Experienced arguers, for their part, engage in a fuller range of argumentative purposes regardless of condition, suggesting that experience may bring a higher degree of consistency across contexts of argument. However, despite the apparent shortcomings in the novice group, our findings offer a ray of hope. Novices in our study naturally engaged in convergent discourse when seeking consensus, pointing to an underlying competence in exploring opposing viewpoints (maintaining probative relevance) while engaged in critical dialogue (maintaining pragmatic relevance). They used dialogue as a vehicle to understand and explore opposing viewpoints and they naturally refined and strengthened their arguments in light of valid critiques. Data from our experienced arguer group suggests that under the right conditions, individuals can learn to engage in productive discourse across a variety of contexts. With experience, guidance, or reflection, novices may learn to replace the goal of “winning” an argument by deflecting opposing views, with the goal of constructing an argument by weighing the relative strength of claims and evidence on either side of an issue. In this way, they may discover that the joint activity (or “we-intentions”) found among experts and manifest in attempts to elicit, elaborate and critique claims, is more productive when arguing to learn than the competitive (“I-intentions”) manifest in advancing hasty counter-arguments and disconnected claims. While the former is not a universal aim across all argumentative contexts, it is far more likely to optimize the value of argumentation in educational contexts.

In short, the key educational implications of our experimental findings emerge at the intersection of argumentative purpose and dialectical relevance. In order to help students fully leverage the value of argumentation for knowledge construction, teachers must help students see that argumentative dialogue (be it information-seeking, persuasion, deliberation or inquiry) is fundamentally a joint activity that aims not only at critical engagement with ideas, but also exploratory and reconstructive engagement. The goal is not simply to advance claims and counter-arguments, but to do so within the larger context of carefully eliciting, understanding, critiquing, and revising arguments through dialogue. When stu-

dents pursue this rich array of argumentative purposes they are more likely to make their thinking explicit, examine that thinking in a framework of alternative claims and evidence, and revise their thinking in ways that promote the construction of knowledge. For this to happen, students must learn to frame argumentation as a form of thinking together, regardless of whether their aim is to prove via inquiry, to decide via deliberation or to influence via persuasion.

References

- Andriessen, J. 2006. Arguing to learn. *Handbook of the learning sciences*, ed. K. Sawyer, 443-459. Cambridge: Cambridge University Press.
- Asterhan, C. S. C. 2013. Epistemic and interpersonal dimensions of peer argumentation: Conceptualization and quantitative assessment. In *Affective learning together*, eds. M. Baker, J. Andriessen and S. Jarvela, 251-272. New York, NY: Routledge, Advances in Learning and Instruction series.
- Asterhan, C. S. C., R. Butler and B.B Schwarz. 2010. Goals for learning and interaction in argumentation and conceptual change. In *Learning in the Disciplines: Proceedings of the 9th International Conference of the Learning Sciences (ICLS 2010) - Volume 1, Full Papers*, eds. K. Gomez, L. Lyons and J. Radinsky. Chicago IL: International Society of the Learning Sciences.
- Asterhan, C. S., and B. B. Schwarz. 2009. Argumentation and explanation in conceptual change: Indications from protocol analyses of peer-to-peer dialog. *Cognitive science* 33(3): 374-400.
- Asterhan, C. S. C., and Schwarz, B. B. 2016. Argumentation for learning: Well-trodden paths and unexplored territories. *Educational Psychologist* 51(2): 164-187.
- Berland, L. K., and V. R. Lee. 2012. In pursuit of consensus: Disagreement and legitimization during small-group argumentation. *International Journal of Science Education* 34(12): 1857-1882.
- Dole, J. A., and G. M. Sinatra. 1998. Reconceptualizing change in the cognitive construction of knowledge. *Educational psychologist* 33(2-3): 109-128.
- Felton, M., A. Crowell, and T. Liu. 2015. Arguing to agree: Mitigating the effects of my-side bias through consensus-seeking dialogue. *Written Communication* 32(3): 317-331.

- Felton, M., A. Crowell, M. Garcia-Mila, and C. Villarroel. 2019. Capturing collaborative argument: An analytic scheme for coding deliberative dialogue. *Learning, Cognition and Social Interaction*. Advance online publication DOI: 10.1016/j.lcsi.2019.100350
- Felton, M., M. Garcia-Mila and S. Gilabert. 2009. Deliberation versus dispute: The impact of discourse goals on learning outcomes in the science classroom. *Informal Logic* 29(4): 417-446.
- Felton, M., M. Garcia-Mila, C. Villarroel and S. Gilabert. 2015. Arguing collaboratively: Argumentative discourse types and their potential for knowledge building. *British Journal of Educational Psychology* 85(1): 372-386.
- Felton, M. and D. Kuhn. 2001. The development of argumentative discourse skills. *Discourse Processes* 32(2/3): 135-153.
- Ferretti, R. P., MacArthur, C. A., and Dowdy, N. S. (2000). The effects of an elaborated goal on the persuasive writing of students with learning disabilities and their normally achieving peers. *Journal of Educational Psychology*, 92(4): 694.
- Fischer, P., and T. Greitemeyer. 2010. A new look at selective-exposure effects an integrative model. *Current Directions in Psychological Science* 19(6): 384-389.
- George, D., and M. Mallery. 2010. *SPSS for Windows step by step: A simple guide and reference, 17.0 update* (10a ed.) Boston: Pearson.
- Iordanou, K., D. Kuhn, F. Matos, Y. Shi, and L. Hemberger. 2019. Learning by arguing. *Learning and Instruction* 63(1): 101-207.
- Kuhn, D. 2005. *Education for thinking*. Harvard University Press.
- Kuhn, D., and J. Lao. 1996. Effects of evidence on attitudes: Is polarization the norm? *Psychological Science* 7(2): 115-120.
- Lao, J., and D. Kuhn. 2002. Cognitive engagement and attitude development. *Cognitive Development* 17(2): 1203-1217.
- Leitão, S. 2000. The potential of argument in knowledge building. *Human development*, 43(6), 332-360.
- Macagno, F. 2018. Assessing relevance. *Lingua* 210(1): 42-64.
- Macagno, F., and S. Bigi. 2017. Analyzing the pragmatic structure of dialogues. *Discourse Studies* 19(2): 148-168.
- McBurney, P., D. Hitchcock, and S. Parsons. 2007. The eightfold way of deliberative dialogue. *International Journal of Intelligent Systems* 22(1): 95-132.
- Nickerson, R. S. 1998. Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology* 2(2): 175-220.
- Nussbaum, E. M. 2008. Collaborative discourse, argumentation, and learning: Preface and literature review. *Contemporary Educational Psychology* 33(3): 345-359.

- Nussbaum, E. M., and O. V. Edwards. 2011. Critical questions and argument stratagems: A framework for enhancing and analyzing students' reasoning practices. *Journal of the Learning Sciences* 20(3): 443-488.
- Nussbaum, E. M., C. M. Kardash and S. E. Graham. 2005. The Effects of goal instructions and text on the generation of counterarguments during writing. *Journal of Educational Psychology* 97(2): 157.
- Nussbaum, E. M. and G. M. Sinatra. 2003. Argument and conceptual engagement. *Contemporary Educational Psychology* 28(3): 384-395.
- Osborne, J. 2010. Arguing to learn in science: The role of collaborative, critical discourse. *Science* 328(5977): 463-466.
- Reznitskaya, A. and I. A. Wilkinson. 2017. *The most reasonable answer: Helping students build better arguments together*. Cambridge, MA: Harvard Education Press.
- Thiebach, M., E. Mayweg-Paus and R. Jucks. 2016. Better to agree or disagree? The role of critical questioning and elaboration in argumentative discourse. *Zeitschrift für Pädagogische Psychologie* 30(2-3): 133-149.
- Walton, D. 2003. *Relevance in Argumentation*. Routledge.
- Walton, D. 2010. Types of dialogue and burdens of proof. In *Computational Models of Argument: Proceedings of COMMA 2010*, eds. P. Baroni, F. Cerutti, and M. Giacomin. IOS Press.
- Walton, D., A. Toniolo, and T. J. Norman. 2020. Dialectical models of deliberation, problem solving and decision making. *Argumentation* 34(1): 163-205.
- Weinberger, A. and F. Fischer. 2006. A framework to analyze argumentative knowledge construction in computer-supported collaborative learning. *Computers and education* 46(1): 71-95.
- Wolfe, C. R. and M. A. Britt. 2008. The locus of the myside bias in written argumentation. *Thinking and reasoning* 14(1): 1-27.

Appendix A. Argumentative Discourse Coding Scheme

Questions

- | | |
|---------------|---|
| Agree-? | A question that asks whether the partner will accept or agree with the speaker's claim. |
| Acknowledge-? | A question that checks whether the partner is comprehending what is being said. |
| Case-? | A request for the partner to take a position on a particular case or scenario. |

Clarify-?	A request for the partner to clarify his or her preceding utterance without an interpretation.
Justify-?	A request for the partner to provide reasons in support of a claim
Position-?	A request for the partner to provide his or her global position.
Question-?	A simple informational question which does not refer back to the partner's preceding utterance.
Respond-?	A request for the partner to react to the speaker's utterance
Stance-?	A request for the partner to state his or her position on an alternate argument.
Substantiate-?	A request for the partner to support his or her preceding claim with evidence

Statements

Accept	An explicit agreement to a Position-Qualification, Interpret or Recap
Accommodate	A statement integrates a point advanced by the partner by qualifying or changing the speaker's own argument or commitment set without a change in position.
Acknowledge	A statement that serves to validate the partners immediately preceding utterance. They can communicate interest, understanding, appreciation, clarity, or attentiveness.
Add	An elaboration of the partner's preceding utterance that does not strengthen their claim
Advance	An extension of the partner's preceding utterance that strengthens the partner's claim.
Agree	A statement of agreement with the partner's preceding utterance
Add-	An utterance offered in support of the partner's preceding utterance—provides data in support of claim made by the partner.
Substantiate	Response to Question-?
Answer	When the speaker advances a claim for the opposing side linked to another code
Anticipate	A new claim that does not connect to the preceding dialogue

Aside	An off-topic or tangential comment that does not add to the argument about the issue
Case Answer	A response that takes a stance a Case-? advanced by the partner.
Case	An anecdote with details that could be used to pose a question or present an argument
Clarify	A clarification of speaker's own argument in response to the partner's preceding utterance.
Concede	An agreement about a reason put forth by the partner
Continue	A continuation or elaboration of the speaker's own last utterance which ignores the partner's immediately preceding utterance.
Coopt	An explicit assertion that uses the partner's immediately preceding utterance to serve the speaker's own opposing argument.
Counter-A	A disagreement with the partner's preceding utterance, accompanied by an alternate argument that introduces a claim unrelated to the claim advanced in the partners preceding utterance.
Counter-C	A disagreement with the partner's preceding utterance, accompanied by a critique which undermines the strength of a claim presented in the partner's preceding utterance.
Counter-UC	An unjustified claim that the speaker's position is better than the partner's position. Or, an unprompted restatement of the speaker's position without further justification or elaboration.
Disagree	A simple disagreement without further argument or elaboration.
Dismiss	A simple and isolated statement that the partners preceding reason is unimportant or irrelevant.
Framing	Narrowing the focus or breadth of the argument, or setting one or more directions to proceed with an argument
Interpret	A paraphrase of the partner's preceding utterance with or without further elaboration. Either a statement or a rhetorical question
Initiate	A statement that begins a line of reasoning that does not contain an argument and may conclude with a case question.

Justify	A reasons provided in response to a request for reasons.
Position	A statement of global position on the topic of discussion
Position-Q	A qualification of a claim or position statement in response to a partner's argument
Recap	An attempt to summarize claims to review established agreement or disagreement
Reject	An explicit disagreement with a Position-Qualification, Interpret or Recap
Refuse	An explicit refusal to respond to the partner's preceding question.
Stance	The answer to a stance question—speaker's response to a request for their position on a reason.
Substantiate	Evidence in support of a speaker's own claim that can be offered in response to a request for evidence or to set up the speakers argument.
Withdraw	An explicit retraction of a point, critique, or reason in light of the partner's preceding utterance.