

MAIEUTIC FRAME PRESENCE AND QUANTITY AND QUALITY OF
ARGUMENTATION IN A PAIDEIA SEMINAR

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ABSTRACT

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Maieutic Frame Presence and Quality

And Quantity of Argumentation in a

Paideia Seminar

(Under the direction of Jill Fitzgerald)

The purpose of the current study was to explore the potential associations between the number of maieutic frames and the number and quality of arguments high school students produced in a Paideia Seminar. A maieutic frame is the structure of the kind of talk that occurs when discussants use intellectual dialogue to collaborate to make meaning out of sophisticated text, by responding to open-ended questions. Participants from two different high schools discussed seven seminar texts during the 2002-2003 and 2004 and 2005 school years. The seminar discussions were transcribed and coded for number of maieutic frames, number of arguments, quality of arguments, and type of maieutic question. A nonparametric test was conducted to determine whether the seminars from two different schools could be collapsed across schools. Main analyses were conducted to explore whether when discussions contained more maieutic frames, more arguments were produced, and whether the arguments exhibited a higher level of quality. Similarly, main analyses explored whether more challenging maieutic questions were associated with higher quality of argumentation. The conclusions from the current study were the following: a) degree of maieutic frame presence is highly positively associated with both degree of quantity and quality of

argumentation in a Paideia seminar, and b) degree of challenging maieutic question presence is highly positively associated with quality of argumentation.

Conclusions from the current study suggested that the maieutic frame is an effective construct to describe the structure of the Paideia seminar discussions, and a helpful tool to explore the conditions that were related to particular outcomes. Because the current study is the first about maieutic frames and argumentation in Paideia seminars, it opens up several new avenues for research about maieutic frame presence and argumentation beyond the context of Paideia seminars.

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CHAPTER 1

Introduction and Rationale

The purpose of this study is to examine the relationships between maieutic frame presence and degree of quantity and quality of argumentation in a Paideia Seminar. Two research questions guide the study: Is degree of maieutic frame presence associated with degree of quantity and quality of argumentation in a Paideia Seminar, and is degree of challenging maieutic question presence related to quality of argumentation?

What is a Maieutic Frame and What is Argumentation?

Maieutic Frame

The term “maieutic” has been used in both a broad and a more narrow way. More generally, the word refers to the dialogic pedagogical approach Socrates used with his disciples in ancient Greece. The word derives from the Greek *maieutikos*, which is, literally, midwifery. Socrates compares the way he used dialogue to teach his students with the way his own mother assisted pregnant women when labor came. Socrates’ use of questions to allow learners to first identify misconceptions and then restructure thoughts was analogous to the midwife’s support and instructions to a woman in labor. More specifically, however, maieutic refers to one particular aspect of Socratic dialogue, namely the specific moment in

which the discussant or the learner is capable of pulling out, with the aid of the facilitator's questions, a more elaborate new learning (Mondolfo, 1998, Jaeger, 1965).

A maieutic frame is a particular type of discussion frame. A discussion frame is the structure or organization of the talk between two or more people. Discussion frames are connected sequences of statements about a particular topic (Akmajian, Demers, Farmer, and Harnish, 1995), which, from a syntactic standpoint, may be complete sentences, fragments, questions, interjections, and other non-verbal markers of agreement/disagreement or need for clarification (Stubbs, 1983).

The structural elements of a discussion frame are organized in a way that is often unconscious to speakers, yet ritualistic and easily identifiable (Stubbs, 1983). A frame begins with a statement aimed at getting the other speaker(s)' attention. A series of thematically connected statements follows. The ending of a frame is signaled by a change either in topic or participation structure (Wells & Mejía Arauz, 2006).

Maieutic frame is a structural construct I created to describe the scaffolding that enables the maieutic moment. In an ideal Paideia seminar we observe a maieutic frame in a discussion when the following three components are present: 1) the dialogue is shaped around open-ended maieutic questions; 2) elaboration of ideas is grounded in textual references, prior knowledge, or experiences; and 3) the discussion (in the form of interpretations, explanations, diverging ideas, and new understandings) is inductive and exploratory, rather than deductive and conclusive. A maieutic frame weaves together aspects that characterize Paideia seminars—as defined in the seminar protocol—with expectations about the kinds of talk that should happen when the students discuss a text following the Paideia seminar structure. For example, the seminar protocol encourages the use of textual

references and textual connections to analyze and understand the text. Seminar participants also use their prior knowledge and experience to relate to the ideas and values in the text. In a Paideia seminar, students are expected to discuss using interpretations and explanations, diverging ideas, and ideally construct new understandings collectively.

A maieutic frame makes the structure of a seminar discussion visible by breaking it into identifiable components that contain the elements that a good seminar discussion is expected to have to create the maieutic moment. In this way, a Paideia seminar discussion, once transcribed, can be analyzed by examining each maieutic frame and exploring potential associations between maieutic frame presence and other constructs of interest, in this case, argumentation.

Argumentation

Argumentation is a social, dialogic, intellectual, and linguistic activity by which individuals try to convince other individuals of the feasibility of a particular standpoint (Van Eemeren & Grootendorst, 2003; Van Eemeren, Houtlosser, & Snoeck, 2007).

Argumentation, the verb, refers to the process of using verbal tools (spoken or written), rational abilities, and argumentative indicators (Van Eemeren et al, 2007; Kuhn & Udell, 2003). Argumentation, the noun, references the argument itself. Verbal expressions become arguments when they happen in a context in which they serve a specific communicative purpose, which is to either justify or refute a viewpoint (Van Eemeren et al., 2003).

Rationale

What is the broader problem within which the current study is situated?

In recent years, research about classroom discussion has highlighted the positive impact of certain types of discussion participation on students' development of critical and

independent thinking, interpretive authority, and argumentation (Chinn, Anderson, & Waggoner, 2001; Chinn & Anderson, 1998; Resnick, Salmon, Zeitz, Wathem, & Holowchak, 1993; Reznitskaya, Anderson, & Kuo, 2007; Clark, Anderson, Kuo, Kim, Archodidou, & Nguyen-Jahiel, 2003). Researchers have observed student participation in various interactive discussion formats and have found that qualities of discussion such as student control of topic and participation are related to increased critical thinking, authentic interpretation of text meaning, and more complex argumentative patterns. When students are given more freedom to interact with each other, bring their knowledge and experiences to the discussion, and share the floor more openly, students' reasoning becomes more sophisticated, their textual interpretations are the product of their own thinking, and their arguments are richer.

However, many classroom discussions still serve as vehicles for the verification of information recall. Recitation is still a very widely used form of classroom discussion (Chinn et al., 2001; Billings & Fitzgerald, 2002; Kuhn et al., 2003, Reznitskaya et al., 2007). Thus, when discussions are used to test or replicate knowledge, students do not develop, imitate or practice basic argumentative skills such as the ability to relate causes, generate adequate evidence, or construct effective rebuttals (Kuhn, 1991; Andriessen, 2003). Even teachers who have attended series of workshops learning how to accomplish the Paideia Seminar may not enact such seminars (Billings & Fitzgerald, 2002), and consequently their students' cognitive development may not be enhanced.

It is possible that greater understanding of which key structural elements of a discussion are related to specific student outcomes, such as critical and independent thinking, interpretive authority, and elaborate argumentation, could facilitate teacher implementation of discussion in a way that could more favorably impact student learning. For instance,

perhaps delineation of maieutic frames within discussions, making the structure of a seminar discussion visible, might enhance our ability to better understand how discussion structure might help the acquisition of specific student outcomes. If such structure is related to student outcomes, perhaps teachers could be taught about how to identify maieutic frames, and about how to implement them.

The present study addresses the challenge of identifying a possible discussion structure and whether it might be related to one student outcome, argumentation. Results could shed light upon a possible avenue for teacher education.

How Might Maieutic Frames Facilitate Argumentation?

Hypothetically, the presence of maieutic frames in a seminar discussion should facilitate the development of higher degrees of student argumentation. First, maieutic questions open up discussions in a much broader way because they require participants to put their knowledge to the test. Answers to maieutic questions may not be evident in the text, but, by virtue of how they are phrased, they may require students to delve into subtleties or ambiguities they had not thought of (Mondolfo, 1998). Participants must think of powerful reasons and arguments to respond to other participants. Second, elaboration of ideas is required in order to present an idea to other discussants. Therefore, students must look for ways in which textual evidence or prior knowledge can best support their points of view. Similarly, as they listen to other participants' perspectives, they internally develop arguments and counterarguments to either contribute to or critique other speakers' ideas. The process of internally advancing arguments helps students discover their own viewpoints and respond to those of other discussants (Walton & Krabbe, 1995) by agreeing, disagreeing, critiquing, or elaborating on others' perspectives. Third, inductive and exploratory discussion facilitates the

development of argumentation by fostering the development of alternative outlooks, by widening the spectrum of possible answers to a question, and encouraging divergent thinking (Copeland, 2004).

Argumentation quality is related to the presence of more than one rebuttal (Erduran, Simon, and Osborne, 2004; Clark, Sampson, Weinberger, and Erkens, 2007) and several grounds (i.e., data, warrants, and backings that support the claim). Higher quality of argumentation is evident when arguments contain one or more rebuttals, “because students’ capacity to develop good thinking is reliant on [their] ability to justify and defend [their] beliefs” (Erduran et al. 2004, p. 926). The presence of multiple rebuttals is an accurate indicator of argumentation quality because they force students to change perspectives and assess alternative viewpoints. (Clark et al., 2007; Duschl, Ellenbogen, and Erduran, 1999; Erduran et al, 2004; Osborne, Erduran, and Simon, 2004; Simon, Erduran, and Osborne, 2006).

Hypothetically, the presence of maieutic frames in a seminar discussion should also be associated with high quality argumentation. First, maieutic questions—because they are not circumscribed to a single correct answer—offer students more opportunities to examine multiple argumentative perspectives, use several data and other argument components. More specifically, challenging maieutic questions foster the development of high quality arguments because they tap into cognitive conflicts that emerge when students must assess their own arguments in light of other students’ counterarguments. Therefore, the increased presence of challenging maieutic questions should also be hypothetically associated with higher quality argumentation. Second, maieutic frames require that students elaborate ideas using multiple sources of evidence, and therefore build arguments that include more than a simple claim and

factual data. Finally, when maieutic frames are present, inductive and exploratory talk provide a context in which students are encouraged to think and interpret texts providing original, alternative arguments.

There is no evidence that I know of that has addressed maieutic frames in classroom discussion including Paideia Seminar, nor concerning their potential relationship with students' ability to construct arguments. However, research on argumentation, particularly in the context of classroom discussion is extensive and continues to be of interest among researchers (Eichinger, Anderson, Palincsar, and David, 1991; Pontecorvo and Girardet, 1993; Resnick et al., 1993; Chinn & Anderson, 1998). Researchers have suggested that student participation in discussion leads to better argumentation (Reznitskaya, Anderson, McNurlen, Nguyen, Archididou, & Kim, 2001; Haroutunian-Gordon, 1991; Kuhn, Shaw, & Felton, 1997; Chinn, et al., 2001; Reznitskaya & Anderson, 2002; Kim, Anderson, McNurlen, Archodidou, Nguyen, Tillmanns, & Reznitskaya, 2000; Clark et al., 2003). Finally, there is evidence of the fact that discussion settings facilitate the acquisition of more sophisticated argumentative strategies, because children tend to imitate certain argumentative practices they observe in other learners (Anderson, Nguyen-Jalil, McNurlen, Archodidou, Kim, Reznitskaya, Tillmanns, & Gilbert, 2001, Kuhn, 2001; Nussbaum, 2002; Schunck, 1998; Maloney & Simon, 2006).

Significance of the Study

Maieutic frames are a new and original construct developed to observe how argumentation unfolds within a Paideia seminar discussion. They should allow us to see the underlying structure and components of the talk that happens when discussants engage in collaborative intellectual dialogue about a text.

If it turns out that, when more maieutic frames are present in a discussion there is more argumentation, then maieutic frames could also be used to study how the structure of a discussion relates to other outcomes such as students' ability to identify logical errors in arguments. Knowing how to use logic when developing an argument, and being able to identify faulty reasoning are necessary skills to facilitate the development of critical thinking.

If positive relationships between maieutic frame presence and quantity and quality of argumentation are found in Paideia seminars, it will be interesting to examine whether the same relationships between maieutic frames and quantity and quality of argumentation could also occur in other discussion contexts in a similar manner. If the same relationship is found in non-Paideia discussion contexts, a maieutic frame may not be circumscribed only to Paideia seminars, but may be a skill some teachers develop and use intuitively.

Future studies might further explore issues such as the role of each maieutic feature in the development of argumentation, what kinds of maieutic questions facilitate argument production and how they do it, or the relationships between arguments and students' elaboration of ideas in a seminar.

If presence of maieutic frames is associated with a high degree of quantity and quality of argumentation, Paideia seminars might be considered effective contexts where teachers model and provide explicit instruction about how to argue, and thereby enhance the acquisition of higher-level argumentative skills in their students. Teachers may think of maieutic frames as vehicles that assist children in building high quality arguments, and may therefore structure their discussions in such a way that maieutic frames emerge.

Definition of Constructs

Maieutic Frame Features and Their Order. In an ideal Paideia Seminar, we observe a maieutic frame in a discussion when the following three components are present: 1) the dialogue is shaped around open-ended maieutic questions; 2) elaboration of ideas is grounded in textual references, prior knowledge, or experiences; and 3) the discussion is inductive and exploratory, rather than deductive and conclusive. The components of a maieutic frame are organized in a non-hierarchical manner. We shall first examine the three components more fully, and then explain what is meant by non-hierarchical organization.

Dialogue shaped around open-ended maieutic questions. Open-ended maieutic questions addressed to the learners allow them to explore ideas and respond to them in a non-prescribed way. The process of exploring and responding to ideas entails reading and thinking with skepticism, anticipating and elaborating arguments that explain their viewpoints to other discussants. The questions are supposed to challenge students to evaluate alternative views from competing voices that juxtapose as textual meaning is examined (Nystrand, 1997) and reassess their knowledge when cognitive conflicts emerge (Almasi, 1995). The focus on questions, rather than answers, is that questions have a maieutic function in that they assist the learner in bringing out ideas with more rational thinking (Copeland, 2004; Elder & Paul, 1998). It is also possible for participants to create their own questions about meaning as they agree or disagree in their views of textual issues (Haroutunian-Gordon, 1998).

Maieutic questions also perform three different functions in a maieutic frame: 1) they initiate a discussion, 2) they add rigor and maintain a sense of direction in the discussion, and 3) they trigger cognitive conflicts. Based on these three functions, we may say, there are three different types of maieutic questions that may occur within a maieutic frame. We have

labeled these questions 1) opening maieutic question, 2) guiding maieutic questions, and 3) challenging maieutic questions, respectively.

Elaboration of ideas is grounded in textual references, prior knowledge, or personal experience. In maieutic frames, an essential feature of student responses is that they constitute elaborations of the ideas presented in the text. We can observe elaboration of ideas when students make connections between different sections of the text, or between the seminar text and a previously read text, making predictions and explanations. Elaboration is also evident when participants use textual references, prior knowledge, or personal experiences as support or exemplification to build an argument (Chinn et al., 2001). While there is ample freedom to disagree with other opinions, diverging views must always be rooted on aspects that are visible or implicit in the text, which enrich the conceptualizations that students build as they converse. Rather than presenting a subjective opinion, students use textual reference to construct arguments in the context of the discussion. The text acts as the background against which arguments are exposed and contested, brought up and built upon.

Prior knowledge and experience allow participants to make more tangible connections between new concepts and those previously learned (Chinn et al., 2001). As Teasley (1995) notes, when children hear several other children verbalizing ideas and thinking processes their own learning is enriched.

The discussion is inductive and exploratory, rather than deductive and conclusive. A maieutic frame can also be defined as more philosophical, inductive, and exploratory than other discussion frames. Rather than resolving an intellectual problem, or arriving at a conclusion, a maieutic frame allows students to open up to alternative modes of thinking

(Copeland, 2004). Ideas are approached by adopting more exploratory outlooks, without immediately narrowing to conclusions. Ideal Paideia Seminars do not end in a concluding statement or a resolution of an intellectual problem (Copeland, 2004). In a maieutic frame, inductive and exploratory talk is observed in students' exploration of alternative viewpoints, questioning of assumptions, and even acknowledging that there might not be one single right answer to a question.

Non-hierarchical structure of the discussion refers to the organization of the elements of a frame. Although maieutic frames always begin with a maieutic question, the other two elements, elaboration and inductive talk, do not follow a particular order within the frame. The non-hierarchical structure of the discussion is also visible in the distribution of student and teacher participation. Maieutic frames typically exhibit exchanges moving back and forth from one speaker to another, with new speakers joining the discussion, as opposed to traditional classroom scenarios in which the teacher holds the floor most of the time (Chinn et al., 2001; Nystrand, 1997). Participants are encouraged to intervene without asking for permission from the teacher or facilitator, and to address their comments to the whole group, rather than to the teacher.

The following is an example of a maieutic frame from a seminar transcript about Kant's essay *Metaphysics of Morals*. Apart from a maieutic question, a maieutic frame must contain at least one of each of the following components: a) textual references, connections across texts, or references to prior knowledge and experience; b) explanations or interpretations; and c) diverging ideas or new understandings. In the case of this example, the frame begins with the rewording of an opening maieutic question that had been previously asked. Each maieutic frame component has been identified in the text.

Facilitator: Tell us if you agree or disagree with Kant's definition and why. (*reiteration of previous opening maieutic question*)

Student 1: I think the moral value depends on who's, like, it may be different depending on who you're talking about. (*interpretation*). Like the person you did the good deed for, they may not know whether or not you did it because you wanted to or whether or not you did it because it was good. So it may just be the same moral value to them, but to you, it's probably going to be more, well I hope it's going to be more satisfying to you that you did it, even though you didn't want to, but you did it because it was good. (*explanation*)

Student 2: I disagree with Kant because he kind of takes, he kind of like exaggerates his statement about kindness like having no moral value. (*textual reference*) And then he like exaggerates and says that "only duty can get you anywhere," like, can actually be good. (*textual reference*) And, that's not the truth. I mean he, it might be to some extent. It might be, I mean duty might get you somewhere. But, you kind of have to have an equal balance of moral value, like and kindness, and duty.

Student 3: Well I agree with Kant because, when you do something out of kindness, and enjoy doing it out of kindness, simply from kindness, it's not really coming straight from your character. (*diverging idea*) I mean you can have characteristic that's kindness. But when you should do an act of goodness, this is coming straight from your character, like, from like deep inside of you. (*explanation*) Because like, if you're just being nice because you like being

nice, this is almost like an everyday task, but it doesn't really affect anything much. (*explanation*)

Student 4: It's no more different than what you usually do.

Student 1: It affects the person you help.

Student 3: That may be true, but for personal reasons. (*diverging idea*)

Maieutic questions. Maieutic questions are open-ended questions that facilitate the exploration of a text's essence or fundamental meaning. The essential quality of a maieutic question is its ability to ignite a thoughtful response, arouse a controversy, or challenge an established viewpoint. Typically, open-ended maieutic questions do not look for facts or dictionary definitions. Rather, they call upon interpretations which are text-based, but that require synthesis and evaluation. Although grounded in the text, maieutic questions allow for multiple correct answers and are oftentimes open-ended, since they do not limit students' responses to the teacher's preconceived correct answer, but rather encourage participants to explore a variety of viewpoints.

Maieutic questions fall into three categories based on the function they perform on the discussion: 1) maieutic questions that open up a discussion or initiate the exploration of a new topic are called opening maieutic questions; 2) maieutic questions that add rigor and keep a sense of direction of the discussion are called guiding maieutic questions; and, 3) maieutic questions that trigger cognitive conflicts or question preconceived ideas are called challenging maieutic questions. Examples of each type of question from seminar transcripts are presented in Table 1. In the present study, only challenging maieutic questions will be examined.

Table 1

Examples for the Three Types of Maieutic Questions

Type of Maieutic Question based on the Function they Perform in the Discussion	Example from Paideia Seminar
Opening maieutic question: To initiate a discussion	“What do you think Aristotle means by honor?” “What do truth and falsehood have in common?”
Guiding Maieutic Questions: To add rigor and/or maintain a sense of directions	“Where in the text do you find that? Something to back those up, either one of those statements” “Let’s look at this a little bit from a slightly different direction. He says the hidden purpose, such as self-interest or because they feel important, the question I want you to think about is: Are they fulfilling their moral duty?”
Challenging Maieutic Question: To trigger cognitive conflicts	“What would someone who disagrees with you say?” “What’s an alternative outcome?”

Paideia Seminar. The Paideia Proposal is grounded on three basic pillars of instruction. One is the acquisition of knowledge by means of didactic instruction in the different content areas. The second pillar is the development of intellectual skills through coaching and supervised practice. The third pillar is the enlarged understanding of ideas and values, which takes place during the seminars. Overall, seminar discussions constitute only 25% of the total instructional time.

A Paideia seminar is “a collaborative, intellectual dialogue facilitated with open-ended questions about a text” (Billings & Roberts, 2006). In a Paideia seminar, learners collectively explore an artifact (literary document, artwork, musical piece, and math or science problem) and through discussion come to a more elaborate understanding of its meaning. The Paideia seminar is one of three components of what Mortimer Adler defined as the Paideia Proposal, a pedagogical framework devised in the 1980s as a way to improve the quality of education of the American public school system. Adler viewed the Paideia Proposal as “a truly democratic system that aims not only to improve the quality of basic schooling in this country, but also aims to make that quality accessible to all our children.” (Adler, 1982, p.1). This way of looking at teaching and learning, he suggested, would allow all students equal access to basic, quality education so that they could later earn a living, be good citizens, and live full lives (Adler, 1998).

Adler (1982) holds that the goal of Paideia seminars is to produce an “enlarged understanding of ideas and values by means of maieutic or Socratic questioning and active participation.” (p.8) Maieutic or Socratic questioning is dialogic in nature. The teacher or facilitator is an assistant to the learner as he/she discovers evidence and is able to reason independently. The maieutic method begins with a question (e.g., can virtue be taught?)

which leads participants to engage in a dialogue in order to unpack the meaning inherent in the question and, eventually, to an increased collective (or co-constructed) understanding of the matter. Similarly, Paideia seminars foster dialogue through more complex intellectual questions that often challenge students to go beyond literal meaning, and to build elaborate textual interpretations. Active dialogic participation not only leads students to read with understanding and move beyond surface meaning, but most of all, it allows students to think for themselves rather than replicate scripted answers (Haroutunian-Gordon, 1991; Nystrand, 1997).

Adler envisions a Paideia seminar as resembling the kinds of conversations Socrates and his followers have in Plato's dialogues, where Socrates is neither an instructor nor a coach. Socrates claims to be an assistant to the process of thinking through which his learners will give birth to their own ideas. Socrates feigns ignorance, so as not to dictate right or wrong answers, while at the same time guides the participants by means of questions that will lead them to uncover meaning.

The role of a Paideia facilitator is twofold. On the one hand, he or she is a moderator; that is, he/she makes sure that the conversation flows smoothly and in a respectful manner. The facilitator's job is not to assign talking turns but rather to maintain a civilized, constructive, and collaborative dialogue (Billings & Roberts, 2006). On the other hand, the facilitator must keep participants engaged in the conversation most of the time by asking provocative questions that require students to explore the text with an open-minded perspective. Questions have a central role in guiding the discussion and more specifically, in challenging students by eliciting sociocognitive conflicts as the conversation progresses (Almasi, 1995).

Argumentation is a dialogic, intellectual, and linguistic process by which individuals use logic to examine and build up claims or positions about concepts, situations, ideas, and viewpoints, on the grounds of supportive evidence. Argumentation implies the use of a series of intellectual strategies, first to evaluate the logical integrity of an argument, and then to be able to expand it or contradict it in light of existing evidence. Argumentation is also highly dependent on social and ideological context (Walton, 1998; Kuhn et al., 1997; Kuhn & Udell, 2003).

Toulmin (1958) identifies six argument components: 1) the claim or assertion, 2) the data that supports the claim, 3) the warrant, which links a claim to the data and specifies the relationship between the two, 4) backings, which are additional supporting statements, 5) qualifiers, which are adverbs that indicate the strength of the relationship between warrants and a claim, and 6) rebuttals, or counterarguments. However, arguments don't always contain all six elements. In fact, the simplest forms of arguments may be made of a claim plus data. Arguments that are more complex include several data, warrants, backings, and one or more rebuttals. Similarly, arguments may be said to have some sort of structure. Claims usually come first, and are followed by one or more data. After the data come the warrants, which may be followed by backings, qualifiers, and/or rebuttals. Arguments end with either the concession of the argument's validity in terms of the data and warrants that sustain it, or with a new claim, that introduces a new argument.

Argumentation Features and their Order

In the following section, first, I define each of the elements and their role in an argument. Next, I describe the manner in which the elements fit together to make up the argument structure.

Six elements may occur in an argument: a claim, one or several data, warrants, backings, qualifiers, and one or more than one rebuttal. A claim is an assertion of a fact. Data are factual information that support the claim. Warrants are the rational connections between the claim and the data. Backings are statements that provide additional support to the warrants. Qualifiers indicate the strength of the relationship between warrants and a claim, and rebuttals or counterarguments are statements that indicate the conditions under which the claim may not be true, or statements that contradict the claim (Toulmin, 1958).

The structure of an ideal argument may vary. The last element in the argumentative structure is the rebuttal. The simplest argument has a claim and a few data. Complex arguments have claims, which are supported by several data, warrants, backings, and qualifiers. Elaborate argumentation also exhibits more than one rebuttal (Erduran et al, 2004). If all six elements are present, they tend to occur in the following order: the claim initiates the argument and is followed by the data. After the data come the warrants, followed by backings and qualifiers. In the present study, the necessary elements for an argument are, in the following order, at least one claim, at least one datum, and a warrant linking the claim with the data.

Classroom discussion. We define classroom discussion as the dialogue in which students enrich their knowledge through social interaction (Alvermann, O'Brien, & Dillon, 1990). Classroom discussions are collaborative instances in which ideas are verbalized and understanding results from shared exchange (Sandora, Beck, & McKeown, 1999). In these discussions participation turns and topic choice are not mandated by the teacher, but emerge spontaneously as the discussion unveils (Billings & Fitzgerald, 2002). Similarly, classroom discussions include verbal exchanges between students and the teacher and among students,

both of which relate to learning (Mercer & Littleton, 2007). Classroom discussion features reasoned argumentation as the process through which participants explore ideas (Chinn & Anderson, 1998). As a result, there is sustained engagement and motivation (Mercer & Wegeriff, 1999; Maloney & Simon, 2006).

Classroom discussions are a well-used strategy to discuss literary works, historical documents, and works of art. Discussions should facilitate a collective understanding of texts by touching on key ideas in a way that forces students to make meaning beyond the literal, or traditionally expected answers, unveiling meaning that is apparently evident but which can be interpreted in multiple ways, thus enriching a collective construction of knowledge. Although classroom discussion has been the most widely used method of instruction in the United States for over a century, many discussions, even nowadays, are based on questions that point at surface aspects of texts, where prescribed answers are often expected (Nystrand, 2003). These discussions do not push thinking towards the exploration of alternative views, but emphasize a pattern of recitation where emphasis is on information recall rather than divergent thinking. On the other hand, when discussions are shaped around maieutic frames, it is expected that understanding will arise from the participants' conversation as they cultivate meaning (Haroutunian-Gordon, 1998).

CHAPTER 2

Review of the Literature

Chapter Overview

In this chapter, I discuss the importance of maieutic frames, argumentation, and challenging maieutic questions, and more specifically, within a Paideia seminar. I address the importance of these constructs first from a theoretical perspective and then draw evidence from related research to explain their implications in more detail.

In the first section of the chapter, I discuss the importance of classroom discussion and what is known about it, to help us understand some of the features of Paideia seminars as a discussion context. In the second section, I explain what is known about Paideia seminars from previous research studies and explain how maieutic frames should, in theory, show what happens in a Paideia discussion, and more specifically, why they should be associated with quantity and quality of argumentation. In the third section, I explain the importance of argumentation, drawing from studies in which researchers have examined argumentation in various learning contexts. In the fourth section, I discuss why and how challenging maieutic questions in Paideia seminars relate to quality of argumentation. A fifth section discusses methodological approaches to the study of classroom discussion, Paideia seminars, and argumentation. Finally, I provide a chapter summary.

Why is Classroom Discussion Important to Student Learning and What is Known About it?

Maieutic frame is a construct that I have created to describe the structure of the kind of talk that happens when students discuss texts guided by open-ended maieutic questions.

The notion of “maieuticness” derives from the Socratic idea of using dialogue, and particularly questions, to assist learners in bringing out meaning and understanding. I have borrowed the concept from Socrates. Given that this is a new construct, there is no literature, nor research on it or its application. However, existing research on classroom discussions about texts can provide a framework that can help us understand the importance of maieutic frames, particularly with regard to how it relates to argumentation.

I have also relied on the theory and research on discussion in general because Paideia seminars are one form of classroom discussions, and because research about other discussion formats can help us understand the possible results of the present study. The kinds of conversations that foster argumentation are those that have open-ended questions, that demand the use of textual references, and that lead students to interpret and explain using their prior knowledge and experience. By the same token, these argument-rich conversations exhibit inductive and exploratory talk in which participation is open and not structured by the teacher. What researchers have found out about the associations between classroom discussion and quantity and quality of argumentation is, largely, very similar to what maieutic frames are made of, and to what happens in a Paideia seminar. These findings can therefore contribute to interpreting and understanding maieutic frame presence in Paideia seminars.

Theoretical perspectives. Classroom discussion is a broad construct that encompasses many fundamental aspects of learning. The more recent theoretical approaches in the research literature about classroom discussion are: sociocognitive and sociocultural theories, dialogism, and transactional reading theory. This section uses these four approaches to examine classroom discussion.

Sociocognitive and sociocultural perspectives are the prevalent frameworks in most of the recent research literature about classroom discussion. Both approaches are based on Vygotsky's assertion that human thinking is grounded in social life (Pontecorvo & Girardet, 1993; Reznitskaya & Anderson, 2002). Social cognition recognizes the reciprocal interaction between the learners and their environment, and the influence of these interactions in learning. Social contexts and learners mutually affect each other. Cognition functions as a mediator, guiding the relationships between what learners know and what they don't know. Kuhn and Udell (2003), for example, explain how the development of argumentative skills is dependent on a cognitively rich environment. Such cognitively rich environment can be found in peer dialogue, where learners have to evaluate, construct, and respond to arguments. Resnick and colleagues (1993) view reasoning as a form of social practice. The sociocultural perspective places more emphasis on the social and historical processes that underlie learning, as well as on the semiotic mediation of language. Within this framework, social interactions are fundamental agents of transformation in learning. In the sociocultural context, discussions are defined as socially and culturally situated events in which understanding and knowledge is attained as a shared culture that results from linguistic interaction (Bridges, 1979; Almasi, O'Flahavan, & Arya, 2001). Anderson et al. (2001) extend this idea by explaining the importance of social influences in the development of reasoning, a concept that is strongly rooted in Vygotsky's idea of internalization, also defined by Rogoff (1995) as participatory appropriation. Mercer and Littleton (2007) refer to this process as "interthinking." According to Vygotsky, internalization occurs when behaviors that have been acquired through external social interaction "grow into the mind," (Bodrova & Leong, 1996, p. 21) and become higher mental functions. Pontecorvo and Girardet (1993)

add that children who engage in student-led discussions not only exhibit a discourse of a higher cognitive level, but also internalize and understand the role of socialization as a learning activity. Sociocultural factors acquire a major significance when we take into account the kinds of linguistic and reasoning experiences that students bring to classroom discussions, which ultimately account for the differences amongst learners (Mercer and Littleton, 2007; Heath, 1983).

The discovery of the work of Russian semiotician and literary theorist Mikhail Bakhtin and his concept of dialogism offers another lens through which discussion has been observed. According to Bakhtin (1981), reasoning is always dialogical, and the plurality of voices at the intrapersonal and interpersonal levels is enriched by the social, cultural, and ideological undertones that speakers bring to a conversation (Reznitskaya et al., 2001; Anderson et al., 2001). Discourse is dialogic because it happens within the context of an ongoing tension between speakers as their voices juxtapose (Nystrand, 1996). The dialogic nature of classroom discussion must therefore be understood as an interaction of roles, authorities, and reciprocities among participants (Nystrand & Gamoran, 1991). Tomasello (1999) adds:

The perspectival nature of linguistic symbols, and the use of linguistic symbols in discourse interaction in which different perspectives are explicitly contrasted and shared, provide the raw material out of which the children of all cultures construct the flexible and multiperspectival—perhaps even dialogical—cognitive representations that give human cognition much of its awesome and unique power (p. 163).

When classroom discussions are dialogic (Billings & Fitzgerald, 2002), language becomes a “thinking device” (Nystrand, 1996) instead of an information transmitter. In

classroom practice, when teachers use discussions only to transmit information, language is no longer dialogical.

Vygotsky and Bakhtin converge in their belief that open-ended dialogue is central to thought development, whether in the form of social interactions or inner speech. A dialogic perspective on discussion acknowledges the incorporation of multiple voices that construct meaning, the context in which it occurs, and the semiotic aspects of language.

Finally, some studies that examine literature-based discussions have used Rosenblatt's transactional theory of reading to describe the processes, context, and interactions taking place when teachers and students discuss and interpret a literary work. The transactional approach to reading is based on the idea that there is a reciprocal relationship between a reader and a text, in which the reader brings experiences that ultimately shape his or her understanding and meaning making (Rosenblatt, 2005). This conception entails that reader-text relationships are unique, and involve both the reader's mind and emotions; resulting on efferent (or information-based) and aesthetic (or personal/emotional) responses (Rosenblatt, 1978; Spiegel, 2005). Because of the reader's crucial role in meaning making, the transactional theory of reading serves as an interesting context with which to address the kinds of talk that occur when students interpret and analyze literary texts in various discussion formats (Sandora et al., 1999; Almasi et al., 2001; Almasi, 1995).

What is known about classroom discussion? Research on classroom discussion is abundant and varied. Investigations about the role of classroom discussions in the enhancement of comprehension abilities can be traced back as far as the 1900's (Alvermann & Hayes, 1989; Nystrand, 1997), and particularly the 1950's (Bloom, 1948; Bloom, 1954).

Since the beginning of the twentieth century, it has been consistently reported that discussions are not frequently used as instructional instances, and when used for these purposes, they are, for the most part, teacher-centered. In the fifties, for example, Bloom observed that teachers talked about 50% of the total instructional time. Ten years later, studies revealed similar results: two thirds of instructional time was taken by teacher talk (Bellack, Kliebard, Hyman, and Smith, 1966), and more than 80% of the questions teachers asked during discussions were aimed at testing textbook information recall (Nystrand, 2006). In the seventies and eighties, research continued to confirm this trend (Duffy, 1981; Durkin, 1978-79; Goodlad, 1984; Guszack, 1967; Sarason, 1983; Cazden, 1988; Tharp & Gallimore, 1998). Nystrand, Gamoran, Kachur, & Prendergast (1997) conducted a large study of language arts classes in which they observed that teachers spent 85% of their instruction time either lecturing or having students perform passive activities such as worksheet completion and recitation. In a study that included over 1,400 middle and high school students in 64 classrooms across the United States, Applebee, Langer, Nystrand, & Gamoran (2003) reported an average of 1.7 minutes of open discussion per sixty minutes of language arts class. Compared to findings from previous research (e.g., Nystrand et al., 1997) the number is two times higher.

The increase in the number of minutes spent in classroom discussion, however, did not produce much change in the manner in which discussions were held. Many of the observed discussions continued to exhibit what Cazden (1988) described as the I-R-E (initiation-response-evaluation) structure: a teacher initiates discussion with a question, the student responds, and the teacher evaluates the response. Many discussions seemed to be scripted and monologic (Bakhtin, 1982; Nystrand, 2006). That is, teachers either posed the

questions they wanted their students to answer, and assessed them with respect to how closely they matched their expected responses, or spoke most of the time.

As researchers identified correlations between cognitively productive discussions and comprehension (Nystrand, 2006; Murphy and Edwards, 2005) and reading engagement (Almasi, 1996), the instructional value of classroom discussions began to be acknowledged, and classroom teachers implemented effective discussion formats. During the nineties, researchers focused on the learners, and the ways in which classroom discussions could help them understand texts (Alvermann, Young, Weaver, Hinchman, Moore, Phelps, Thrash, & Zaluski, 1996; Alvermann et al., 1990; Almasi & Gambrell, 1994; O’Flahavan & Almasi, 1991; Nystrand & Gamoran, 1991; Nystrand, 1997). Most of these studies revealed that students believed that classroom discussions assisted them in better understanding the texts they read (Alvermann et al., 1996), and some indicated that student performance in reading comprehension also improved because of having participated in discussions (Nystrand & Gamoran, 1997; Applebee et al., 2003). However, research also revealed that teachers who used classroom discussion regularly found it hard to relinquish authority to students in terms of participation control and topic choice. On the other hand, it was observed that teachers who performed scaffolding and coaching roles allowed for more opportunities for students to think and learn together (O’Flahavan, 1989; O’Flahavan, Stein, Wiencek, & Marks, 1992; Almasi, 1995; Eeds & Wells, 1989; Clark et al., 2003). Scaffolding decentralizes instruction, and allows participants to gradually acquire independence to structure, manage, and develop cognitively productive discussions, without relying on an adult’s active facilitation. For example, O’Flahavan (1994) suggested that teachers elicit dialogue by showing students how to extend or elaborate their viewpoints. Coaching proved to be effective when used at the

beginning and closing stages of discussion. At the beginning, a teacher's coaching facilitates the establishment of protocols for participation and turn taking, and goals for discussion. As the discussion ends, the teacher may assist the students in assessing how much each participant contributed to the groups' goals, and to what extent the discussion enriched their individual and collective understanding.

Some studies have shown that participation in classroom discussions about literature is strongly correlated with improved writing skills (Gamoran & Kelly, 2001). More specifically, when discussions require that students engage in argumentative discourse, their persuasive writing is characterized by having more rebuttals and better arguments (Clark et al., 2003). A study by Reznitskaya and colleagues (2001) indicated that students who were engaged in Collaborative Reasoning oral discussions produced better persuasive essays than those who did not experience that kind of discussion.

Current research also reveals that teachers are aware of the instructional value of classroom discussion (Applebee, Burroghs, & Stevens, 1994; Nystrand, 2006; Commeyras & DeGross, 1998), but there also seems to be consensus as to the fact that educators have different conceptual understandings of what constitutes a good discussion (Goodlad, 1984; Alvermann & Hayes, 1989). In fact, discussions differ from class to class and from teacher to teacher, and this is evident in the manner in which they are implemented, the formats used, and the strategies developed (Alvermann et al., 1990; Langer, 1995, Nystrand, 2006). Alvermann and her colleagues (1990) also noticed that, although teachers could tell an effective discussion from an ineffective one, their own definitions of good discussions did not match their actual practice. This finding appears to be particularly interesting, as it continues to be reported in more recent research (i.e., Nussbaum, 2002; Simon et al., 2006).

Three factors seem to explain the discrepancy between teachers' knowledge of what constitutes a good discussion and its actual enactment. First, traditional recitation patterns of classroom interaction are strongly embedded in classroom practice and teachers often find it hard to break free from its use, because it helps them verify student knowledge and ensure that content has been covered (Applebee et al., 1994; Chinn et al., 2001; Almasi, 1995; Mehan, 1979). Discussion questions are oftentimes used to assess recall of information (Alvermann et al., 1990), rather than to expand understanding or foster divergent thinking. For example, Applebee, Burroughs, and Stevens (1994) found that teachers felt more comfortable discussing topics in the realm of literary form and content, rather than discussing students' responses and reactions, or social issues inherent in the text. As suggested by Applebee et al., (2003), the use of authentic questions and more elaboration on students' contributions to the dialogue should engage students in a cognitively productive conversation. Second, the demands of high-stakes testing often force teachers to teach to the test, and therefore not much time is devoted to classroom discussion because of "covering material" or test preparation (Nystrand & Gamoran, 1997; Alvermann et al., 1990). Lectures are often used to cover the curriculum, with very little dialogic interactions. Teachers may feel the pressure of the administration that may criticize them if they walk into their classroom and find the students and the teachers engaged in a conversation and not "doing school." Finally, teachers face issues of power and authority. Classroom discussion entails relinquishing the teacher's authority, both in terms of participation and topic. Good discussions rely upon students' ability to monitor participation and freedom to interact with one another without asking for permission. In student-guided discussions, the topics for discussion are agreed upon by the participants, and not imposed by the teacher (Billings &

Fitzgerald, 2002). Teachers often fear that such a discussion might turn to be chaotic in terms of participation, discipline, and/or that students will talk about issues that are not content-related, and may see discussion as a waste of time.

Researchers have examined the effectiveness of different discussion formats or models, such as Collaborative Reasoning (Chinn et al., 2001; Reznitskaya & Anderson, 2002; Clark et al., 2003), Literature Circles (Eeds & Wells, 1989), Instructional Conversations (Tharp & Gallimore, 1988), Interpretive Discussions (Haroutunian Gordon, 1991), and discussion-based Envisionments of Literature (Langer, 1992; 1995; 2001). More recently, researchers have addressed discussion within virtual formats such as the chat room or other forms of online discussion (Clark et al., 2007; Morgan & Beaumont, 2003; Bowker, 2000; Brandon & Hollingshead, 1999).

Why are Paideia Seminars Important to Student Learning and what is Known About Them?

Theoretical perspectives. Paideia Seminars are “collaborative intellectual dialogues facilitated with open-ended questions about a text” (Billings & Roberts, 2006). When Adler and his colleagues first introduced the Paideia Proposal, the work of Soviet psychologist Lev Vygotsky was just beginning to be explored in the western world. However, many Vygotskian theoretical principles can be related to the Paideia model. Clearly, the first connection that one makes between Paideia and sociocognitive and sociocultural tenets is the role of social environment in the learning process. Vygotsky’s notion of internalization states that “the higher functions of child thought first appear in the collective life of children in the form of argumentation, and only then develop into reflection for the individual children.” (1981, p.157). The context of Paideia seminars is defined as collaborative, intellectual, and dialogic (Billings & Roberts, 2006). Collaboration implies that learning is co-constructed by

the exploration of participants' interpretations and viewpoints, and by the intellectual and dialogic exercise that participants undergo as they evaluate ideas and construct arguments in their minds. Dialogue in a Paideia seminar is twofold: it happens within the group, among participants, and it happens within each participant, among converging, diverging, and emerging ideas that participants examine in their minds. Vygotsky (1978) observed a similar process in what he defined as inner and outer speech, both of which mediate the acquisition of knowledge. In a similar manner, Bakhtin (1981) talks about the plurality of voices that can be heard not only in the external utterances of conversations, but also internally.

A second theoretical principle strongly linked to the social dimensions of learning has to do with the semiotic mediation of language. Vygotsky states that language functions as a bridge that connects social functioning and individual thinking (1981). In the Paideia context, the actual discussion is a mediating tool in that it is the means through which the texts are understood. Language in a Paideia seminar functions as a semiotic mediator by allowing participants to express their thinking and interpret other people's thinking.

What is known about Paideia seminars? Most of the published studies about Paideia seminars are grounded on sociocognitive and sociocultural tenets, particularly the Vygotskian principles previously described. Some studies, particularly those that have looked at language and discourse analysis, have also used a sociolinguistic outlook (Billings & Fitzgerald, 2002), to examine the kinds of roles participants adopted during Paideia discussions, and how these positions in the discussion affected its development.

Sociolinguistic theory analyzes the convergence of social aspects of language such as identities, roles, relationships, and cognitive factors. Billings and Fitzgerald observed that the teacher in their study did not succeed at fostering a dialogic discussion among students, but

rather spent most of the time in a format where she initiated discussion, students responded, and she responded to the students. From a sociolinguistic perspective, her role as “knowledgeable coach” prevented her from acting more as a facilitator so that the students could take control of the discussion and decide who talked and what would be discussed.

Two studies (Billings & Fitzgerald, 2002; Wortham, 2001) examine discussion types, and three (Billings & Fitzgerald, 2002; Billings & Roberts, 2006; Wortham, 2001) address student and teacher roles in Paideia Seminars. Billings and Fitzgerald (2002) observed several high school discussions of one teacher and a group of students, to examine the roles adopted by the teacher conducting the seminar, and the kinds of discussions that occurred within that context. The study revealed that the teacher was in a transitional state between what an ideal Paideia facilitator does, and what teacher-directed discussion leaders do when they hold classroom discussions. This was evident in the fact that the teacher dominated the talk 45% of the time, used information-seeking questions instead of open-ended questions, and tended to engage on I-R-E (Cazden, 1988) patterns for most of the seminar time. As Billings and Roberts (2006) point out, the role that seminar facilitators perform is non-traditional and often difficult to assimilate; dialogic discussion (as in a Paideia seminar) requires giving up authority both in content and participation structure (Billings & Fitzgerald, 2002). According to Billings and Roberts (2006), teachers can become effective seminar facilitators when plenty of time is given to the planning, practice, and assessment of each seminar session. These three components—planning, practice, and assessment—constitute a cycle of reflection that allows the teacher to improve his/her role as facilitator of effective questions and moderator of quality discussion.

Wortham (1995; 2001) observed teacher and student roles during Paideia Seminars in which literary works were discussed. Across several seminar sessions, students engaged in productive conversations about literary texts, while at the same time they unconsciously adopted political and ethical positioning based on the issues that the texts addressed. Wortham observed that students could easily identify with characters in the text who shared either their social, religious, moral, or political views. This connection had a positive effect in terms of student engagement with the text, and ultimately, comprehension. Teacher and student positioning during classroom discussions, Wortham argues, can be productive in that it may facilitate students' learning of academic content, but requires tactfulness on the part of all participants to address controversial issues in a respectful, constructive manner.

There are no research studies addressing issues of identity, ethnicity, and/or gender in Paideia discussions. However, Wortham's work shows that Paideia seminars could be a suitable context in which to observe the many ways in which such issues interact, as well as the effect they exert upon the dynamics of a discussion, the topics brought into the conversation, and issues of power and authority. Wortham says that "compelling literature raises political and ethical positions on issues of continuing relevance, and literature classrooms can provide a protected forum to critique the types of positioning that we often adopt unreflectively" (p.62). Paideia seminars, and other classroom discussion formats such as Collaborative Reasoning or Interpretive Discussions are effective contexts in which such issues may emerge and be safely addressed.

One of the factors that explain the lack of published research on Paideia Seminars is its relatively new implementation in schools. On the other hand, interest on the impact of Paideia has often been examined from a school reform perspective; that is, to what extent the

structure of the Paideia Proposal, with its three-column curriculum (didactic instruction, coaching, and seminars) affects student learning. There are several technical reports (e.g., Polite & Adams, 1996; Waldrip, Marks & Estes, 1993; Luecht, 1999; Luecht, 2000; Luecht 2001) where Paideia programs are examined in relation to student academic achievement. Absence of published research is also due to the lack of continuity of the program in some schools. Paideia is not an “immediate results” intervention, and sometimes schools give up on the program without allowing for the necessary time for its development (Billings, L. and Roberts, T., personal communication, January 29, 2008).

What might maieutic frames tell us about Paideia seminars?

As was mentioned in Chapter 1, maieutic frames make the structure of the kind of talk that unfolds in a Paideia seminar visible. In a way, maieutic frames can be a window into students’ thinking, because they allow us to observe how maieutic moments occur, in which students, with the adequate scaffold, can make meaning independently. If such maieutic moments emerge, students will have constructed their own understandings of the text and not reiterated the teacher’s or the author’s words without in-depth thinking.

A maieutic frame identifies the elements of a seminar that provide the necessary scaffolding for students to construct arguments as they examine a text. For example, maieutic frames may reveal the extent to which students use textual references to explain or interpret a text, or the extent to which prior knowledge is used to make meaning, or understand ideas. Similarly, a maieutic frame may show what triggers divergent thinking or new understanding, how disagreements about interpretations are solved or unsolved, or which questions trigger more argumentation building, and which ones don’t.

By looking at the ways in which maieutic frames unfold, teachers might plan seminars that facilitate the emergence of maieutic moments in which participants, referencing the text and relying on their knowledge and experience, can acquire an enriched understanding collaboratively. Knowing which aspects of the seminar to target, teachers can develop challenging maieutic questions that will gauge discussion in such a way that dialogue will be divergent and argumentative.

Why is Argumentation Important to Student Learning, and what is Known About it?

Theoretical perspectives. The theoretical frameworks underlying argumentation date back to Aristotle, who was probably the first one to develop criteria to assess the quality of an argument (Andriessen, 2003). For many years, argumentation theory emphasized structural factors, such as its components and how they were organized within an oral or written argument. The assumption was that underneath a well-structured argument lay coherent, structured reasoning. As studies of argumentation became more empirical, the focus on its structural components gave way to an emphasis on the context in which argumentation occurred.

Contemporary approaches to argumentation have been strongly influenced by sociocultural theories, and more specifically, by the acknowledging of the social foundations of teaching and learning as described by Vygotsky and Bakhtin (van Lindenagger & Renshaw, 2004). Within this scope, reasoning is seen as a form of social practice (Resnick et al., 1993; Maloney & Simon, 2006; Kuhn & Udell, 2003; Pontecorvo & Girardet, 1993; Almasi et al., 2001; Anderson et al., 2001; Duschl, Ellenbogen, & Erduran 2001; Reznitskaya et al., 2007), in which argumentation is a collective search for reasons and evidence that may cause students to change their viewpoints about a certain idea or value

(Chinn et al., 1998). Thus, a learner's competency in argumentation is acquired through socialization into the argumentative discourses that occur in dialogic settings (Reznitskaya et al., 2007). One of the theoretical conceptions that reinforced the sociocultural nature of argumentation is its definition as a dialogical, interactive process deeply imbued in individuals' everyday activities and relationships.

Sociocultural theory emphasizes the role of social, cultural, and historical forces in the development of thinking at both the intrapersonal and the interpersonal levels. Vygotsky believed that these circumstances determined how learning took place, as well as what was learned. Seen from this perspective, the development of argumentation is shaped by factors and circumstances such as who engages in argumentation, what knowledge and experience those participants possess, what is being discussed, and what social roles and or positions do the participants hold within a group.

Another framework found in research studies on argumentation is social cognition. From a sociocognitive perspective, one of the main avenues of interest for researchers has been the development of argumentative skills (Kuhn, 1991; Kuhn & Udell, 2003; Felton, Kuhn, & Shaw, 1997; Means & Voss, 1996), which only recently has been approached by cognitive psychology. Other areas that research has addressed are the structure of argumentative discourse (Anderson et al., 1997; Clark & Chinn, 1998), and the role of instruction in the development of argumentation (Kuhn, 1991; Voss & Means, 1991). Within this last focus of interest, some researchers (e.g., Anderson et al., 2001; Reznitskaya et al., 2007) have addressed the transferability of argumentative skills to other cognitive domains and/or situations.

What is known about argumentation? Argumentation has become a topic of growing interest among researchers over the past 30 years (van Eemeren, Grootendorst et al., 1996). Cognitive psychologists began to observe discussion participants as they developed argumentative discourse only a few years ago. In fact, at the beginning of the 21st century, there were more publications about theoretical aspects of argumentation, and very few empirical studies about its development (Kuhn & Udell, 2003). Interest on argumentation stems from the belief that social interaction is the basis for individual thinking (Reznitskaya et al., 2001; Cazden, 1988; Commeyras, 1994; Kuhn, 1992), and from the fact that argumentation is inherently a human activity (Voss & Van Dyke, 2001). The Vygotskian principle that “higher functions of child thought first appear in the collective life of children in the form of argumentation and only then develop into reflection for the individual child” (Wertsch, 1981, p.157) underlies these two beliefs.

Current theoretical views on argumentation have been influenced by the approaches that classical Greek and Roman scholars, politicians, and philosophers defined about argumentation as a “way to seek truth” (Voss & Van Dyke, 2001). This is evident in Plato’s description of the Socrates’ dialogical approach to truth seeking in the *Meno*, *Phaedro*, or *Euthyprho*. The Greeks, particularly the Sophists, were interested in determining whether “good argumentation” was, in fact, achievable (Van Eemeren et al., 1996). The Sophists, who were considered professional educators, knew that proficiency in argumentation was a way to acquire political positions or presence in public life, and teachers who were successful at teaching argumentation were highly valued among the Athenians, particularly those seeking public offices.

Centuries later, scholars assessed argumentation quality and structure for how well arguments conformed to formal Aristotelian logic and syllogism. According to Aristotle, reasoning arguments could be categorized as deductive or inductive syllogisms. A deductive syllogism is an argument that begins with a general claim or premise, from which conclusions for specific cases are made; whereas an inductive syllogism is an argument in which a general conclusion is drawn from particular premises. In the twentieth century, however, the study of argumentation moved away from the formalism of traditional syllogism and became more closely associated with persuasive and dialogic discourse. The shift in perspective is largely attributed to the publication of Toulmin's *The Uses of Argument* in 1958, and the work of Perelman and Olbrecht-Tyteca in Europe.

Argumentation, Toulmin believes, is a process of constant reasoning over existing ideas, through the development of reasonable warrants that support a claim. Viewed in this way, the modern approach to argumentation is centered more on the interplay between the elements that make up an argument and less on the inductive or deductive relationship between claims and premises that Aristotle prescribed. Toulmin described argumentation as composed of six elements: a claim, data, one or more warrants supporting the claim, backings, qualifiers, and rebuttals. Theoretically, Toulmin believed most arguments had a structure in which a claim was presented, followed by one or more data. The claim was linked to the data by a warrant that explained how the data supported the claim's assertion. Backings, qualifiers, and rebuttals may or may not be present in an argument, but the presence of one or more rebuttals is indicative of higher quality argumentation.

One of the criticisms against Toulmin's argument model, however, has often been the fact that it applies more accurately to arguments between two people and is not so

effective when describing argumentation within larger groups. Toulmin's model has also been criticized in that argument components, as described in the model, are hard to identify and separate in everyday discourse. Many researchers, however, (e.g., Osborne et al., 2004; Suthers, Toth, and Wiener, 1997; Pontecorvo & Girardet, 1993) have used Toulmin's model to explain and assess argument quality in classroom settings, with adaptations that have allowed for the identification of argument components and structure, and the determination of argument quality.

From the perspective of cognitive psychology, the study of argumentation in classroom discourse offered a lens through which researchers could look at how children constructed arguments collectively, how the development of argument skills developed beyond problem solving (i.e., Kuhn, 1991; Kuhn & Udell, 2003; Anderson et al, 1997), and which factors inhibited or facilitated high quality argumentation. Research has suggested that argumentative competence can be seen in children as young as three years old (Kuhn and Udell, 2003; Anderson et al., 1997; Orsolini, 1993; Stein and Miller, 1993; Stein & Albro, 2001). Anderson et al. (1997) also noticed that young children tend to produce arguments that contain logical gaps and often lack explicit conclusions. In spite of the absence of warrants, references, and logical conclusions, children's arguments appear to be coherent because the context in which they happen facilitates the clarification of ambiguities. This observation is consistent with Schlessinger, Keren-Portnoy and Paruscht (2001) who contend that arguments contain an underlying structure, a certain line of reasoning in which some steps are not verbally enunciated, but that make sense when the structure becomes evident. Analyzing an argument means trying to identify and describe that underlying structure.

Evidence also seems to support that the acquisition of argument skills is developmental in nature (Felton & Kuhn, 2001), that there are gender differences as well as educational background factors that determine argument quality (Dawe, 1934; Kuhn, 1991). Studies about argument generation and argumentative skills indicated that individuals with higher mental abilities and more knowledge about the topic being discussed generated higher quality arguments regardless of their grade level (Kuhn, 1992; Means & Voss, 1996; Perkins, 1985; Voss, Blais, Means, Greene, & Ahwesh, 1986).

On the other hand, researchers have also examined children's use of argument skills in various school contexts (i.e., science, literacy, mathematics, and history discussions). Osborne et al., (2004) used Toulmin's argumentation model to evaluate argument quality in science lessons. Osborne and colleagues point to the fact that argumentation is teacher-specific and teacher-dependent. Argument quality improves, however, when teachers use argumentation and engage students in peer dialogue that allows them to practice and develop argumentative skills (Osborne et al., 2004; Erduran et al., 2004). Wood (1999) stressed the need to develop contexts for argumentation in mathematics, because argument skills are essential to conceptual understanding and knowledge construction (Kuhn, 1992). A fundamental skill seems to be the ability to listen to peers as they explain mathematical solutions. Wood says that when teachers set listening expectations, students are more capable of following their peers' reasoning patterns, identify logical gaps, and develop counterarguments (Wood, 1999). Pontecorvo and Girardet (1993) observed similar findings among elementary school children discussing historical documents.

Recently, the focus on argumentation has been an attempt to trace the macrostructure of argumentative discourse when more than two people engage in conversation (Anderson et

al., 1997; Resnick et al., 1993). There has also been interest in determining the degree to which argument skills can be transferred across cognitive domains (Reznitskaya et al., 2007) and/or abilities. Reasoning skills developed in discussions, for example, transfer to tasks such as argumentative writing (Reznitskaya et al, 2007).

An ample body of research supports the conclusion that student participation in discussion leads to better argumentation (Reznitskaya et al., 2001; Haroutunian-Gordon, 1991; Kuhn et al., 1997; Chinn, et al., 2001; Reznitskaya & Anderson, 2002; Kim et al., 2000; Clark, et al., 2003). It has also been observed that discussion settings facilitate the acquisition of more sophisticated argumentative strategies, as children tend to imitate certain argumentative practices they observe in other learners (Anderson et al., 2001, Kuhn, 2001; Nussbaum, 2002; Schunck, 1998; Maloney & Simon, 2006).

On the other hand, assessments at the national level, as well as reports from various research studies have pointed to the difficulties students show in both identifying and producing arguments ((Kuhn, 1991; Means & Voss, 1996, Reznitskaya et al, 2007). This difficulty has been attributed to the lack of authentic discussion contexts in which students can use argumentative skills (Kuhn, 1991; Paul, 1986). As was discussed earlier, some discussion contexts continue to exhibit traditional recitation formats where no open-ended questions trigger sophisticated argument production. At the same time, the absence of actual systematic instruction and modeling of effective argument construction prevents students from gaining the necessary competences to effectively engage in argumentation (Kuhn & Udell, 2003).

How is the Presence of Maieutic Questions Related to Quality of Argumentation?

Although researchers have not yet examined how argumentation unfolds within a Paideia seminar context, the kinds of discussions that occur in a Paideia seminar should facilitate the development of high quality argumentation. In a Paideia seminar, participation and topic control are less restricted, so students can tailor the discussion more freely, while at the same time maintain intellectual rigor by having to provide textual evidence or use prior knowledge as support for their arguments.

There are no research studies about maieutic questions per se, nor studies about questions in relation to argumentation. However, in studies about the use of open-ended authentic questions (cf. Nystrand et al., 2003; Chinn et al., 2001), researchers have observed that the overall quality of discourse increases. Theoretically, the frequent use of challenging maieutic questions in Paideia seminars should increment the production of high quality argumentation because they refer to ambiguous issues. They address complex ideas in the text and often require participants to face them from more than one perspective. When teachers use challenging maieutic questions, it is more likely that divergence of ideas should emerge. It is also more likely that, because not everyone agrees on a given aspect, more complex arguments and counterarguments are created.

Methodologies

Classroom Discussion

In this section, I discuss some similarities and differences in methods used in the study of classroom discussion, across the most relevant studies, particularly those that have explored how discussions affect and facilitate student reasoning.

While most of the research on classroom discussion has documented its positive effects on comprehension, their methodological approaches vary significantly. As has been

mentioned earlier, there are numerous discussion formats which share commonalities but are, ultimately, different in terms of implementation, procedures, and/or expectations for participants. Some of the discussion formats that have been explored include discussion-based envisionments of literature (Langer, 1992; 1995; 2001), Instructional integration of writing, reading, and conversation (Nystrand, Gamoran, & Carbonaro, 2001), Instructional conversations (Tharp & Gallimore, 1988), and Collaborative Reasoning (Chinn et al., 2001; Reznitskaya & Anderson, 2002). The exploration of these approaches as significantly different from discussion as recitation is centered on the belief that these formats exemplify what Vygotsky theorized about teaching and cognitive development (Tharp & Gallimore, 1991) and a redefinition of teaching as “assisted performance.” What researchers have been able to examine is how each of these formats captures the benefits of classroom discussion as a context in which students exhibit increased cognitively productive talk, with the teacher providing only the necessary assistance for them to perform independently.

For participants, the study of classroom discussion comprises the entire spectrum of elementary, middle, and secondary education, including college students discussing texts. Studies include a wide spectrum of ethnic, gender, and socioeconomically different populations, to account for differences that could be attributed to these factors. The inclusion of participants from diverse backgrounds has pointed, among other things, to the effect of cultural factors such as prior knowledge, in students’ production of more or less elaborated arguments. For example, Kuhn (1991), and Means & Voss (1996) observed differences in argument production as a result of differences in cognitive ability.

The use of combined quantitative and qualitative methods of analysis in many research studies restates the interest of many researchers to provide with quantifiable data

about the relationships between discussions and cognitively productive activity, while at the same time reveal the qualitative richness of the data. An interesting example of this combination is Almasi's (1995) study about the nature of sociocognitive conflicts among fourth graders engaged in literary discussions. Almasi designed a quasi-experimental study that revealed cognitive and sociolinguistic differences between teacher-led and peer-led discussions. Using ANOVA she was able to determine differences in number of cognitive conflicts students engaged in while discussing in the two different contexts (teacher-led and peer-led), and the duration of each conflicts. At the same time, constant comparison methods allowed her to identify and describe the types of conflicts that emerged in the two settings. Finally, using MANOVA and discriminatory function analysis, Almasi identified which indicator of discourse was the most discriminatory with regard to each context.

Quasi-experimental designs have been used extensively. Some studies have been designed as quasi-experimental to examine the differences between discussions happening in different contexts (e.g., teacher-led versus student-led discussions), the use of intervention strategies such as explicit instruction on argumentation (Reznitskaya et al., 2007), teacher professional development workshops on fostering argumentative skills (Erduran et al., 2004) or Collaborative Reasoning (Chinn et al., 2001; Anderson et al., 2004).

There is also great variation across studies with regard to data sources. Although the use of classroom observations and video or audio tape transcriptions is the major source of data, other tools complement this information. The use of pre and post assessments to assess reading comprehension, and discussion tasks such as Kuhn and Lao's (1996) assessment tool have helped determine pre intervention conditions and group differences. Other studies include interview protocols to gather data about students and teachers' conceptions of

classroom discussion or experience as discussion facilitators (Clark et al., 2003; Anderson et al., 2004; Reznitskaya et al., 2007).

An interesting indicator of discussion quality has been the analysis of the kinds of questions used in classroom discussion. Chinn et al., (2001) examined the type and frequency of teacher questions in recitations and Collaborative Reasoning. They noticed that teachers who were less successful about yielding authority in the discussion used questions as a means to exert control, using questions over more than 70% of their talk turns, for the purposes of forcing students to maintain their arguments in line with the teachers' line of thought. In another study, Nystrand, Wu, Gamoran, Zeiser and Long (2003) showed the positive impact of authentic teacher questions, uptake, and student questions in changing a discussion from a more monologic stance, to a truly dialogic discussion.

Paideia Seminars

From a methodological perspective, the majority of published studies about Paideia seminars have used case study (i.e., Billings & Roberts, 2006; Wortham, 2001; Wortham, 1995), narratives, or grand case analysis (Billings & Fitzgerald, 2002) based on the observation of several seminars over a given period of time. Participants are usually one teacher and a group of high school students, typically engaged in discussions about literary works, within the context of a Language Arts class. There are no published studies about Paideia seminars in the elementary or middle grades. Most of the studies do not report whether the use of Paideia seminars is embedded within the whole Paideia program, or whether they only use Paideia to complement their instruction. Knowing how the seminars fit in the wider school context is important, in order to assess the impact of expertise level in seminar discussion, and how that degree of expertise affects findings. If the school has

adopted the Paideia program as a whole, it may be expected that students be more familiarized with the seminar procedures, the kinds of questions asked, or the use of textual references to back up arguments. If, on the other hand, the seminar experience is occasional, students may not always exhibit the behaviors that are typical of a Paideia seminar.

Data collected for research studies about Paideia seminars consists of observation field notes, transcripts, video and/or audiotapes, teacher and informant student interviews. Not much information is given as to how transcriptions were made, coded, or what units of analysis were used. In fact, only in one study of four studies are these aspects described (Billings & Fitzgerald, 2002). With regard to analyses techniques, microanalysis, grand case analysis, and discourse analysis are used to examine the participants' utterances and identify common themes. In Wortham's (2001; 1995) studies of how participants discuss literary works in a Paideia seminar, discourse analysis illustrates the manner in which social, ethical, and political positionings are adopted by participants.

Argumentation

The study of collaborative argumentation as it relates to classroom discussion, and more specifically to students' thinking, was only recently incorporated to the field of cognitive psychology (Kuhn & Udell, 2003). Up to the beginning of the 21st century, most of the literature about collaborative argumentation was focused on theoretical aspects, and very few studies explored how the skills for argumentation developed across different age groups. Lately, however, research on argumentation has broadened to include aspects such as determination of argumentation quality, intervention studies, and the transferability of argumentation skills to or from other discourse settings, such as writing. The large spectrum of argumentation research has also led to greater methodological diversity.

Regarding participant demographics, studies about argumentation have included various settings, including inner city schools, urban and suburban population, at-risk students performing below grade level on reading comprehension tests, alternative public schools, parochial and private schools, and vocational community college young adults. Ethnic, gender, socioeconomic, and sociocultural diversity is also present. Sample sizes in the studies range from single classrooms of about 20 students plus their teacher, to sets of hundreds of students (see, for example, Reznitskaya et al., 2001; Anderson et al., 2001).

Argumentation in classroom and/or small group discussion has been examined across grade levels that range from elementary school to young adult or college students, although studies at the high school are rather recent. Studies in the elementary grades have included students as young as second grade (Wood, 1999), but the majority of studies in elementary school refer to fourth grade students. One of the reasons for addressing argumentation development at such a young age seems to be the presumption that these skills develop at a young age (Felton & Kuhn, 2001), although not much is known about how they evolve. A number of studies with large samples of fourth grade children have examined their ability to produce sound arguments when discussing stories using Collaborative Reasoning (Chinn et al., 2002; Anderson et al., 2002; Reznitskaya et al., 2007). Chambliss and Murphy (2002) examined how well fourth and fifth graders could represent the global structure of argumentation, and how it varied from that of adults. The focus of this study is more on argumentation recall rather than production, but the representation of arguments has also been used to assess argument construction in other studies, and seems to indicate that argument production can be inferred from argument representation (see, for example, Reznitskaya et al, 2007; Clark et. al, 2003).

There are a few studies about argumentation in Middle School, particularly in the context of science lessons (e.g., Erduran et al., 2004; Osborne et al., 2004, Simon et al., 2006). When young teenagers engage in argumentation, they seem to focus more on supporting their own arguments rather than on trying to understand and address opposing arguments (Felton & Kuhn, 2001). This finding coincides with what was observed in younger children (e.g., Pontecorvo & Girardet, 1983) who focused more on their arguments, particularly claims and warrants.

With regard to intervention studies, the main areas of intervention have been teacher professional development and various instructional discussion frameworks. In the first case, some studies examined the extent to which teacher workshops on how to use argumentation in their teaching favored the development of argumentative discourse among middle schoolers in science class (Erduran et al., 2004; Osborne et al., 2004; Simon et al., 2006). Researchers observed teachers across two years and noticed that as teachers used more complex argumentative patterns in their lessons, students also engaged in higher quality argumentation. These results are particularly interesting because they highlight the processes, materials, and strategies that teachers use to create contexts for argument, as well as their personal improved performance over time. Erduran and colleagues were able to quantify and describe qualitatively how this process occurred for twelve science teachers in the United Kingdom. Wood (1999), on the other hand, described a teacher's personal characteristics and instructional strategies (such as developing critical listening skills and encouraging disagreement) that facilitated the development of argumentation in Mathematics class among children as young as 8 years old. In the second case, interventions that favored a less structured discussion format (i.e., one in which students had more freedom to explore topics

and turn-taking was not determined by the teacher) revealed the use of more complex reasoning skills (Chinn et. al., 2002). Comparative studies about open discussion and teacher-controlled discussions (e.g. Au & Mason, 1981) conclude that more cognitively productive discourse is observed when there is a balanced participation. Similar results have been observed in comparative studies of discussions in suburban, rural, and parochial schools (Chinn et al., 2002; Almasi, 1995).

A great variety of methods have been used to analyze data from observations about argumentation development in classrooms. Apart from descriptive analyses, researchers have used quantitative methods when comparing argumentation in open discussion and teacher-centered discussion contexts, or determining the effect of specific interventions at the classroom level. Most studies, however, combine statistical analyses with qualitative descriptions using grounded theory as a framework. The combination of quantitative and qualitative approaches is effective in providing a rich panoramic of how social, cultural, pedagogical, and intellectual factors converge when students are engaged in argumentation through classroom discussions.

Chapter Summary

In this chapter, I have explained the major theoretical underpinnings to address classroom discussion, the use of Paideia Seminars, and argumentation. I have also described the existing research about these constructs, and how their findings relate to and help us understand the notion of maieutic frames. Finally, I have discussed some important methodological approaches that may inform the procedures and analyses in the current research.

Although there is great diversity in the discussion formats examined by researchers, and the ways in which argumentation has been addressed, it is clear that when discussions share the characteristics described earlier in this chapter, argumentation exhibits more complexity and richness. Researchers who have assessed argumentation have advised about the difficulties in identifying argument components, so it is therefore important to test the reliability of the tools used to evaluate argumentation quality. With this in mind, it seems also advisable to examine argumentation not only from a descriptive perspective, but to adopt an exploratory approach in which the qualitative richness of argumentation processes is captured.

CHAPTER 3

Methods

Chapter Overview

In this chapter, I explain the methodological aspects of the current study. I begin by describing the design of the study, the participants involved, and the settings. Next, I explain the coding procedures and variables that will be examined. A third section discusses reliability procedures and their results. In the fourth section, I explain the analyses that were conducted. Finally, I provide a summary.

Design

The data used for the current study was previously collected and transcribed by the National Paideia Center. Two groups of students from two different schools participated in seven Paideia seminar sessions over the course of the 2002-2003 and 2004-2005 school years. One group included 29 sophomores in a kindergarten through twelfth-grade magnet school located in a southeastern United States public school district. The other group included 24 juniors from a public high school in another southeastern United States school district. The seminars were tape recorded by staff from the National Paideia Center, as part of the technical support process after the first year of implementation of the Paideia program at the schools. Each of the seven seminar transcripts was coded for the presence of maieutic frames and argumentation. Four variables were created: (a) Number of Maieutic Frames per 100 Statements, (b) Number of Arguments per 100 Statements, (c) Quality of

Argumentation, and (d) Number of Challenging Maieutic Questions per 100 Statements. I used descriptive statistics to examine the data at a preliminary stage, and Spearman correlation coefficients to examine potential associations among variables of interest.

Setting and Participants

In the following sections, I describe the school contexts in which the seminars took place, and the participants' ethnicity, gender, and socioeconomic status.

Setting. Four Paideia seminars took place at Highlands Magnet School (a pseudonym), a small school with 582 students and 42 teachers, located in a large suburban district in a southeastern state. The ethnicity of the school was largely white non-Hispanic (89%), 5% Asian or Pacific Islander, 3% Black non-Hispanic, and 2% Hispanic. Only 3% of the students in this school qualified for free or reduced lunch. Forty-four percent of the school population was male, and 56% female.

The school has high academic demands for its students. The school had adopted and implemented the Paideia program since its foundation in 2003. All teachers, 71% of whom held a Master's Degree, had had full Paideia training. Paideia training and professional development consists of a three-phase program focused on learning how to plan and conduct Paideia seminars, how to implement Paideia Coached Projects to integrate Paideia seminars into the school curriculum, and how to develop improvement practices and assessment tools. Technical support visits also provide teachers with feedback on seminar planning and seminar conduction. Students and teachers in all subject areas engaged in seminars regularly, so everyone was familiar with seminar procedures and expectations.

Three Paideia seminars took place at Caldwell High School (a pseudonym), with 850 students and 58 teachers. The school was located in a large suburban school district in

another southeastern state. The ethnicity of the school was 62% White, 34% Black, 3% Hispanic, 2% Multiracial, and 1% Native American. About 46% of the school population qualified for free or reduced lunch. Forty eight percent of the students were male, and 52% female. The school had also adopted and implemented the Paideia program for several years, and many of the teachers had had full Paideia training. Students and teachers held seminars on a regular basis, and were therefore familiar with procedures and expectations.

Participants. At Highlands Magnet School, 29 sophomores (17 girls and 12 boys) were engaged in four of the seven seminars. The seminars were part of the school's regular English class activities at Highlands, and were led by a Paideia facilitator, with 22 years of teaching experience, and five years of experience as a core staff trainer at the National Paideia Center. A Paideia facilitator is an experienced seminar leader who models seminar conduction and assists schoolteachers in the planning and development of seminars.

At Caldwell High School, 24 juniors (14 girls and 10 boys) participated in three other Paideia seminars. The school's English teacher, who was also a Paideia facilitator, and had a Master's Degree in English Education and 18 years of teaching experience, facilitated the three seminars. The teacher had four years of experience as core staff trainer at the National Paideia Center.

Data Sources

Audio tapes were recorded by staff from the National Paideia Center for each of the seven seminars. A recorder was placed in the middle of the seminar circle, with two paddle microphones also placed in the middle of the seminar circle, in opposite directions. A teacher hired by the National Paideia Center transcribed the tapes. The transcription rules were designed by the transcriber and are provided in Appendix A.

Coding

In the following sections, I first explain how each transcript was parsed into statements, to determine the units of analysis. Next, I explain the coding procedures for determining maieutic frames and their features. I also describe the procedures for coding of argumentation, the levels for quality of argumentation, and the coding of challenging maieutic questions.

Determination of statements, the units of analysis. Each seminar transcript was parsed into statements as units of analysis. Appendix B shows the complete set of rules for determination of statements. Statements were defined as independent clauses, i.e., groups of related words containing a subject and a verb. Independent clauses can stand by themselves as separate sentences, and thus express a single idea or thought. However, some independent clauses may also have a dependent clause (i.e., a group of related words with a subject and a verb but not expressing a single unit of thought) attached to them. If this was the case, the dependent clause was coded as part of the statement (Whaley, 1981). For example, in the following transcript excerpt, there are two statements uttered by the same speaker:

Dan: Yes, I agree with Steven, because if you help somebody and you get joy from that; that would be like a lot better than doing something because you think you have to do it. (Transcript November 10, 2004)

The first statement is “Yes, I agree with Steven,” whereas the second statement is “because if you help somebody and you get joy from that, that would be like a lot better than doing something because you think you have to do it.” The first statement contains one subject (I) and a verb (agree), and expresses a single idea. The second statement, on the other hand, contains a conditional clause (if you help somebody and you get joy from that) which

is dependent of the independent clause “that would be like a lot better than doing something because you think you have to do it.” Both clauses together constitute a single statement.

In the transcripts, statements were separated by boundary markers (//), numbered and retyped into an Excel spreadsheet. To determine where each transcript began, I decided that the first statement in the transcript would be the facilitator’s first opening question. The last statement on each transcript was statement prior to the facilitator’s prompt to close the seminar discussion or the instructions given to students for their post-seminar activity.

Coding of maieutic frames. In the following section, I define the coding procedures for the identification of maieutic frames and their features in each seminar transcript. I also describe the manner in which the coded information is recorded in the coding sheet (Appendix C).

First, I identified the first open-ended question in the transcript, to determine if it was a maieutic question. A question was coded as maieutic if it complied with any of the following conditions: a) it initiated a discussion, b) it set the stage for the exploration of a topic from multiple points of view, c) it allowed for more than one right answer, d) it added rigor to the discussion by asking for additional evidence, explanations, and/or testing an assertion in a hypothetical situation, or e) it initiated a maieutic frame. Second, after all maieutic questions in a transcript were identified, I examined every statement that came after the opening question and coded them for the other two maieutic features: elaboration of ideas and inductive and exploratory talk. For presence of elaboration of ideas, statements were coded as elaborations using textual references (TR), connection across texts (CT), or elaboration using prior knowledge or experience (PK). For presence of inductive and exploratory talk, statements were coded as interpretation (IN), explanation (EX), diverging

idea (DI) or new understanding (NU). Statements that did not fit in any of the above-mentioned codes were marked with an X on the list of statements. A detailed explanation of each of the codes is provided in Appendix C.

Third, after statements were coded, I identified the end of a maieutic frame. The end of a maieutic frame was signaled by any of the following: a) a new maieutic question (which indicated the beginning of a new maieutic frame), b) a change in the discussion topic, or c) a drastic change in participation structure; for example, if participants who had not spoken before entered the discussion (Stubbs, 1983; Wells, 1993). On the transcript, the end of a maieutic frame was marked with the letters EMF.

Fourth, a frame was labeled as maieutic if it included an opening maieutic question, at least one indication of elaboration of ideas (at least one TR, CT, or PK), and at least one evidence of inductive and/or exploratory talk (at least one IN, EX, DI, or NU).

Fifth, once maieutic frames were identified they were numbered on a coding sheet.

Sixth, procedures 1 to 5 were conducted for each transcript.

Coding of argumentation. Each transcript was also coded for presence of argumentation. First, I examined every statement in the protocol to determine which ones were claims for possible arguments. A claim could be an assertion, the establishment of a fact, a proposition, or something that the speaker wants to prove (Rottenberg, 2000). Thus, a statement that performed such functions was coded as “claim,” and numbered on the coding sheet (Appendix D).

Second, I examined the statements following the claim and coded them as either “data,” “warrant,” “backing,” “qualifier,” “rebuttal,” or null (\emptyset) if they did not fall into any of the categories. A statement was considered data and coded as such, if it provided

information, facts, or grounds to support the claim (Toulmin, 1958). A statement was coded as “warrant” if it functioned as a link between the claim and the data. Warrants are hypothetical statements that asserted that there was a reasonable or logical relationship between the claim and the data (Toulmin, 1958). A statement functioned as backing and was coded as such, if it was an additional assurance to the warrant. A statement was coded as a qualifier if it established conditions under which the claim was supported by the data, or determined the relative strength of an argument. Statements that function as qualifiers contain adverbs of degree such as *generally, usually, seldom, probably, presumably*, etc. Finally, a statement was considered a rebuttal and was coded as such, if it was an objection to the claim, or if it presented circumstances under which the claim would not be held true. Appendix D provides an example of argument coding from an actual transcript.

Third, after all statements were coded, I determined the beginning and the end of an argument. The beginning of an argument was marked by the claim that started each argument in a transcript. The end of an argument was marked by a claim that brought about a new argument, i.e., a claim that introduced a new topic. An argument could also end with a concession of the claim—the acceptance of the argument’s feasibility.

Fourth, after arguments and their components were identified, they were numbered on the coding sheet.

Fifth, procedures 1 to 4 were conducted for each of the transcripts.

Coding of quality of argumentation. After each statement in an argument had been labeled as either claim, data, warrant, backing, qualifier, or rebuttal, I examined each argument and assigned each of them a quality level, using Osborne, Erduran, and Simon’s (2004) analytical framework for assessing the quality of argumentation. The framework contains 5 quality

levels based on the type and amount of argument components found in each argument. For example, an argument that contained a single claim and a counterclaim, with no additional grounds (data, warrants, backings), would be a level 1 argument in the framework by Osborne et al., and would be labeled as such. On the other hand, an argument that contained more than one claim, several ground sources, and more than one rebuttal would be considered a level 5 argument and would be labeled as such. Thus, each argument was labeled as either level 1, 2, 3, 4, or 5, with 1 being the lowest quality level, and 5 being the highest quality level.

Coding of challenging maieutic questions. To code challenging maieutic questions, I went back to the beginning of the transcript and examined each question in it. If a question triggered a cognitive conflict by forcing students to address an issue from alternative perspectives it was coded as a challenging maieutic question.

Variables

In this section, I describe the variables that were created to determine relationships between maieutic frames, arguments, quality of argumentation, and challenging maieutic questions. In order to account for the potential impact of difference in seminar length upon opportunity for frames and argumentation, three of the four variables were standardized with regard to the number of statements per seminar. The three standardized variables were Number of Maieutic Frames per 100 Statements, Number of Arguments per 100 Statements, and Number of Challenging Maieutic Questions per 100 Statements.

The following four variables were created: (a) Number of Maieutic Frames per 100 Statements, (b) Number of Arguments per 100 Statements, (c) Quality of Argumentation, and (d) Number of Challenging Questions per 100 Statements.

For Number of Maieutic Frames per 100 Statements, I identified all the maieutic frames in the transcript, following the coding procedures. The total number of maieutic frames in each transcript was divided by the number of statements in the transcript, and then multiplied by 100. For Number of Arguments per 100 Statements, I identified all the arguments in each transcript, divided the total number of arguments by the number of statements in the transcript, and multiplied that value by 100 to obtain a standardized measure of arguments per 100 statements. For Quality of Argumentation, each argument in each seminar transcript was first coded in terms of quality using Osborne, Erduran, and Simon's (2004) analytical framework. Then the argument quality levels in each transcript were added and divided by the total number of arguments in each transcript. Thus, Quality of Argumentation is the average quality of argumentation for each transcript. For Number of Challenging Maieutic Questions per 100 Statements, I added the total number of challenging maieutic questions in each transcript, divided them by the total number of statements in each transcript, and multiplied them by 100 to standardize the variable.

Reliabilities

Reliabilities were established first for the parsing of transcript into statements, and then for the coding of each statement into maieutic frames, arguments, quality of argumentation, and challenging maieutic questions. I trained a language arts teacher to be the second coder for the current study. For our training sessions, I prepared special training material in which I described each of the steps and procedures to code maieutic frames, arguments, and challenging maieutic questions. The training material included the rules for coding and several examples and non-examples of the features to be coded.

Together, the trained coder and I practiced parsing a transcript into statements. Then, to determine inter-coder reliability, each of us parsed one of the seven transcripts in the study into statements independently. The Cohen's Kappa index of reliability for parsing into statements was .812.

After parsing the transcripts into statements, the trained coder and I independently coded the parsed statements in the transcript for Number of Maieutic Frames per 100 Statements. The Cohen's Kappa index of reliability for maieutic frame coding was .923.

Next, the trained coder and I independently coded the same transcript for determination of Number of Arguments per 100 Statements. The Cohen's Kappa index of reliability for Number of Arguments per 100 Statements was .818.

Then, the trained coder and I independently coded the transcript for determination of Quality of Argumentation. Each identified argument was analyzed and labeled as level 1, level 2, level 3, level 4, or level 5, based on the argument components it contained, and following Osborne et al.'s (2004) analytical framework. The Cohen's Kappa index of reliability for Quality of Argumentation was .889.

Finally, to determine inter-coder reliability for Number of Challenging Maieutic Questions per 100 Statements, the trained coder and I independently coded each challenging maieutic question in the transcript. The Cohen's Kappa index of reliability for Number of Challenging Maieutic Questions per 100 Statements was .947.

Analyses

All statistical analyses were conducted using SPSS 15.0. First, I conducted preliminary analyses to determine whether transcripts coming from two different schools could be collapsed across schools. Preliminary analyses included the Mann-Whitney U test

and examination of transcripts in which the same text was discussed. Preliminary analyses of the data also allowed me to determine whether the variables performed in expected ways. Second, I conducted main analyses, which consisted of Spearman correlations to determine the presence of associations between a) Number of Maieutic Frames per 100 Statements and Number of Arguments per 100 Statements, b) Number of Maieutic Frames per 100 Statements and Quality of Argumentation, and c) Number of Challenging Maieutic Questions per 100 Statements and Quality of Argumentation.

Chapter Summary

This chapter provided an account of the methods that were used in the current study. Seven Paideia seminar transcripts from two different high schools were parsed into statements, and coded for Number of Maieutic Frames per 100 Statements, Number of Arguments per 100 Statements, Argument Quality, and Number of Challenging Maieutic Questions per 100 Statements. The specific procedures for coding were described and explained. Four variables were created for the determination of potential associations between maieutic frame presence and quantity of argumentation, maieutic frame presence and quality of argumentation, and type of maieutic question and quality of argumentation. The seven transcripts were collapsed across schools for the main analyses.

Preliminary analyses included the nonparametric Mann-Whitney U test and examination of transcripts in which the same text had been discussed. Main analyses consisted of Spearman correlations to determine potential associations between a) Number of Maieutic Frames per 100 Statements and Number of Arguments per 100 Statements; b) Number of Maieutic Frames per 100 Statements and Quality of Argumentation, and c)

Number of Challenging Maieutic Questions per 100 Statements and Quality of Argumentation.

Inter-coder reliabilities for transcript parsing into statements, and coding of maieutic frames, arguments, and number of challenging maieutic questions were acceptable.

The analyses conducted and their results are discussed in Chapter 4.

CHAPTER 4

Results

Chapter Overview

In the present study, I address two research questions: 1) Is degree of maieutic frame presence associated with quantity and quality of argumentation in a Paideia seminar and 2) Is degree of challenging maieutic question presence associated with quality of argumentation in a Paideia seminar? In the current chapter, a) I discuss preliminary analyses conducted, b) I explain the main analyses and their results, and c) I provide a chapter summary.

Preliminary Analyses

Two questions were addressed by the preliminary analyses: a) Can data from transcripts from the two different schools be collapsed across schools, and; b) Do the variable distributions and relationships perform in expected ways?

Can Data from Transcripts from the two Different Schools be Collapsed Across Schools?

I conducted a Mann-Whitney U test to determine whether the sets of transcripts from the two different schools could be collapsed across schools. To better understand the results of the Mann-Whitney U test, I then examined the individual transcript variable means and ranges, grouped by school. I also compared variables in seminars 6 and 7, in which the same text was discussed at the two different schools, to see if variables showed similar performance, which would further justify collapsing across schools.

Mann-Whitney U test results. The Mann-Whitney U test is a nonparametric measure that uses ranks of data to test the hypothesis of whether two independent samples come from the same distribution. In this case, the two groups to be assessed were the seminars from group A (Highlands Magnet School) and the seminars from group B (Caldwell High School). The Mann-Whitney U test converts the variable values into ranks, putting them into one set, regardless of their group of origin. Once the ranks have been ordered from lowest to highest in the larger set, the rank scores for each transcript are returned to their corresponding sample, A or B, to replace the raw scores in each set. The mean rank across transcripts (but within school) is calculated. For example, the number “6.00” for Group A for Number of Statements indicates the following: first, pooling across schools, the Number of Statements for each of the seven transcripts was put in rank order. The rank number then replaced the actual raw score for Number of Statements for each transcript. Transcripts were then sorted again by school. The four rank numbers for the four transcripts for School A were then averaged. Therefore, 6 was the average rank for Number of Statements in the larger pool of transcripts, which was collapsed across schools. The test then indicates whether the mean rank for one group differs from the mean rank from the other group. If the p - values for the mean ranks are above .05, the two groups do not differ significantly from each other. If the p - values are small ($<.05$), the two groups differ significantly from each other.

Table 2 displays the results of the Mann-Whitney U test for groups A and B. The p - values for each variable were all above .05. Thus, the hypothesis that the two sets of transcripts came from different populations could be rejected, and the transcripts were collapsed across schools.

Table 2

Grouped Transcripts: Mann-Whitney U Test

Variables	Mean Rank		Mann-Whitney U z (<i>p</i> value)
	Group A	Group B	
Number of Statements	6.00	12.00	.000 (1.00)
Number of Maieutic per 100 Statements	3.50	4.67	-.707(.629)
Number of Arguments per 100 Statements	4.50	3.33	-.707(.629)
Quality of Argumentation	4.50	3.33	-.714 (.629)
Number of Challenging Maieutic Questions per 100 Statements	4.25	3.67	-.367 (.857)

Individual inspection of the transcripts. To better understand the results of the Mann-Whitney U test, I inspected the individual transcripts. Table 3 displays the variable values grouped by school. Group A includes seminar transcripts 1, 3, 4, and 6 from Highlands Magnet School. Group B includes seminars 2, 5, and 7 from Caldwell High School. The two columns at the left present the average and range for each of the variables, as well as the number of statements per transcript, that were examined in each of the two groups.

Table 3 shows that the average values for Number of Maieutic Frames per 100 Statements (3.63 Maieutic Frames per 100 Statements for Group A and 4.14 Maieutic Frames per 100 Statements for Group B) and Number of Arguments per 100 Statements (9.28 arguments per 100 statements for Group A and 7.91 Arguments per 100 Statements for Group B) were very similar. Table 3 also shows that the averages and ranges for the two groups are very similar for Number of Challenging Maieutic Questions per 100 Statements. Group A has an average of .155 and Group B has an average of .113. The range of values for Number of Challenging Maieutic Questions per 100 Statements is .01 to .31 for Group A, and .01 to .32 for Group B. The average values for Number of Maieutic Frames per 100 Statements (3.63 Maieutic Frames per 100 Statements for Group A and 4.14 Maieutic Frames per 100 Statements for Group B) and Number of Arguments per 100 Statements (9.28 Arguments per 100 Statements for Group A and 7.91 Arguments per 100 Statements for Group B) were also similar. For Quality of Argumentation, Group A has 5.22 and Group B has 4.4. When looking at Quality of Argumentation in each transcript, however, Transcript 5 differs from the other transcripts in that it has a Quality of

Argumentation of 3.0, whereas the remaining 6 transcripts range between 4.8 and 5.4. Transcript 5 is the only transcript that differs significantly from the other ones in the set.

Table 3

Variable Values Grouped by School

Variable	Transcript	1	3	4	6	Average	Range
Group A: Highlands Magnet School							
Number of Statements		287	297	301	250	283	250 - 301
Number of Maieutic Frames per 100 Statements		3.83	3.37	3.32	4.00	3.63	3.32 - 4.00
Number of Arguments per 100 Statements		9.43	8.91	7.92	10.80	9.28	7.92 -10.80
Quality of Argumentation		5.40	5.30	4.80	5.40	5.22	4.80 - 5.40
Number of Challenging Maieutic Questions per 100 Statements		.31	.02	.01	.28	.15	.01 - .31
Group B Caldwell High School							
		2	5	7		Average	Range
Number of Statements		282	265	291		286	265 - 291

Number of Maieutic Frames per 100 Statements	3.55	3.40	5.49	4.14	3.40 – 5.49
Number of Arguments per 100 Statements	7.97	5.67	9.90	7.91	5.67 – 9.99
Quality of Argumentation	4.80	3.00	5.40	4.40	3.00 – 6.30
Number of Challenging Maieutic Questions per 100 Statements	.01	.01	.32	.11	.01 - .32

Comparison of seminars 6 and 7. Since teachers in each of the two schools had conducted a seminar on the same text, Aristotle's *Ethics*, I compared the two resulting transcripts, seminar 6 and seminar 7 to determine whether seminars about the same text would contain similar Numbers of Maieutic Frames and Arguments per 100 Statements, as well as similar Quality of Argumentation, and similar Number of Challenging Maieutic Questions. Seminar 6 was conducted at Highlands Magnet School, and seminar 7 took place at Caldwell High School. Because seminars 6 and 7 were discussions about the same text, conducted by equally experienced Paideia seminar leaders, one would expect these two seminars to exhibit similar Numbers of Maieutic Frames per 100 Statements and similar Numbers of Arguments per 100 Statements. One would also expect the Quality of Argumentation to be similar, as the teachers who conducted the seminars had similar experiences as seminar facilitators and had undergone identical training. Overall, seminars 6 and 7 showed several similarities in variable distributions. For seminar 6, there were 4.00 Maieutic Frames per 100 Statements. Seminar 7 had 5.49 Maieutic Frames per 100 Statements. Seminar 6 has 10.80 Arguments per 100 Statements, and seminar 7 has 9.99 Arguments per 100 Statements. It was interesting to observe that both seminar transcripts had exactly the same average Quality of Argumentation— 5.4. With regard to Number of Challenging Maieutic Questions per 100 Statements, seminar 6 had .28 Challenging Maieutic Questions per 100 Statements, and seminar 7 had .32 Challenging Maieutic Questions per 100 Statements. Table 4 displays the means, standard deviation, and range for the four variables across the seven transcripts.

Summary. The results of the Mann-Whitney U test, the inspection of the means and ranges of the seminar transcripts divided by school, as well as the comparison between seminar 6 and seminar 7, in which the same text was discussed, indicated that it

was reasonable to collapse the two sets of transcripts across schools.

Do the variable distributions and relationships perform in expected ways? To address the second question about whether the distributions and relationships of the variables conformed to expectations, I examined descriptive statistics for each of the four key variables used in analyses. Table 4 shows the means, standard deviation, and range for each of four variables for the seven transcripts collapsed across schools. Table 5 shows the values for the variables in each seminar transcript. In the sections that follow, I discuss the distribution with regard to the expectations for Number of Maieutic Frames per 100 Statements, Number of Arguments per 100 Statements, Quality of Argumentation, and Number of Challenging Maieutic Questions per 100 Statements.

Table 4

Mean, Standard Deviation, and Range for Four Variables across the Seven Transcripts.

	Mean (S.D.)	Range
		Minimum-Maximum
Number of Maieutic Frames per 100 Statements	3.85 (.76)	3.32 - 5.49
Number of Arguments per 100 Statements	9.29 (1.05)	7.92 -10.80
Quality of Argumentation	4.95 (1.03)	3.00 - 5.40
Number of Maieutic Questions per 100 Statements	2.41 (.76)	1.51 - 3.60

Table 5

Selected Variable Distribution for Each Seminar Transcript.

Seminar Transcript	Number of Maieutic Frames per 100 Statements	Number of Arguments per 100 Statements	Quality of Argumentation	Number of Challenging Maieutic Questions per 100 Statements
1. Kant: Metaphysics	3.83	9.43	5.40	.31
2. Charlotta Solomon	3.55	7.97	4.50	.01
3. Truth and Falsehood	3.37	8.97	5.30	.02
4. Hippocrates	3.32	7.92	4.80	.01
5. Gassed	3.40	5.67	3.00	.01
6. Ethics (A)	4.00	10.80	5.40	.28
7. Ethics (B)	5.49	9.99	5.40	.32

Number of Maieutic Frames per 100 Statements. Overall, one would expect that well-conducted seminars led by facilitators with similar experience and training in the Paideia program would exhibit similar Number of Maieutic Frames per 100 Statements. The expectation was met. The range across the seven seminars was highly similar. The Number of Maieutic Frames per 100 Statements fluctuated between 3.32 and 5.49, which means that there was a difference in range of 2.17.

A second expectation would be that seminars that contain more intellectual and linguistic complexity, and that deal with universal ideas and values, would exhibit more Maieutic Frames per 100 Statements than those with less complexity and ambiguity. According to Adler (1984), authentic texts, such as philosophical and historical documents, foster the occurrence of cognitively productive talk among students, because they are more linguistically sophisticated and intellectually challenging. The expectation was met that seminars about philosophical texts would exhibit higher Number of Maieutic Frames per 100 Statements than seminars about other kinds of texts. Table 5 shows that the seminars with the highest Number of Maieutic Frames per 100 Statements are seminars 1, 6, and 7, which are seminars in which philosophical texts were discussed. Table 6 also shows that seminars 6 and 7, where students discussed Aristotle's *Ethics*, contained the highest Number of Maieutic Frames per 100 Statements among the seven seminars.

Number of Arguments per 100 Statements. One would expect that the transcripts in which philosophical texts were discussed would contain more Arguments per 100 Statements than transcripts from seminars in which other kinds of texts were discussed.

Philosophical texts contain universal ideas and values that most participants can relate to, and therefore either state a claim or make a rebuttal. Texts that contain philosophical ideas usually challenge the reader to agree or disagree with the statements made by the author using argumentation, not just opinions. Table 5 shows that seminar transcripts 1, 6, and 7—the philosophical texts—contain more Arguments per 100 Statements than those transcripts in which other kinds of texts were discussed.

Quality of Argumentation. It would be expected that the transcripts where there were more Maieutic Frames per 100 Statements and in which students produced more Arguments per 100 Statements would also be transcripts with better Quality of Argumentation. The expectation was met. Table 5 shows that Seminar transcripts 1, 6, and 7—the transcripts with the most maieutic frames and arguments—have the same (and the highest) value for Quality of Argumentation. On the other hand, seminars 2, 3, 4, and 5—the ones with the fewest maieutic frames and arguments—have the lowest Quality of Argumentation.

Number of Challenging Maieutic Questions per 100 Statements. It seems reasonable to expect more Challenging Maieutic Questions per 100 Statements in seminars with more Maieutic Frames and more Arguments per 100 statements, as well as in seminars with higher Quality of Argumentation. It also seems reasonable that discussions about philosophical texts would contain more Challenging Maieutic Questions. The Number of Challenging Maieutic Questions per 100 Statements for each seminar transcript can be found in the last right-hand column of Table 5. The expectation was met. Table 5 shows that the seminars with more Challenging Maieutic Questions per 100 Statements were seminars 1, 6, and 7. Seminars 1, 6, and 7 were also the seminars with more

Maieutic Frames per 100 Statements, more Arguments per 100 Statements, and with a higher Quality of Argumentation. As was previously mentioned, seminars 1, 6, and 7 were seminars in which philosophical texts were discussed.

Summary. As was expected, the seminar transcripts conducted by equally experienced facilitators displayed similar Number of Maieutic Frames per 100 Statements. Additionally, it was expected that the seminar transcripts in which more Maieutic Frames were found, would contain more Arguments per 100 Statements, and higher Quality of Argumentation. This expectation was also met. When philosophical texts were discussed in seminars, it would seem likely that transcripts would exhibit more Maieutic Frames per 100 Statements, more Arguments per 100 Statements, and better quality arguments. Finally, it was expected that those transcripts that contained more Maieutic Frames per 100 Statements, more Arguments per 100 Statements, and better Quality of Argumentation, would also exhibit higher Number of Challenging Maieutic Questions per 100 Statements. This expectation was also met.

Preliminary Analyses Summary

It was decided that transcripts could be collapsed across schools and that the variables performed as expected. First, the Mann-Whitney U test showed that the transcripts from the two different schools did not differ significantly from each other. Second, individual inspection of the transcripts showed similarities in variable ranges and averages across the seven transcripts. Third, the comparison of the two seminars about Aristotle's *Ethics*, Book 1, Chapter 5 also showed similarities in variable distributions.

Results of examination of variable characteristics met expectations for Number of Maieutic Frames per 100 Statements, Number of Arguments per 100 Statements, Quality

of Argumentation, and Number of Challenging Maieutic Questions per 100 Statements. Analyses also showed that transcripts from seminars about more complex texts, such as philosophical essays, tended to have more Maieutic Frames and more Arguments per 100 Statements than those about other less ambiguous texts. Additionally, the transcripts from seminars about philosophical texts also showed higher Quality of Argumentation, and more Challenging Maieutic Questions per 100 Statements.

Main Analyses

In this section, I address the following questions: (a) Is degree of maieutic frame presence associated with quantity of argumentation in a Paideia seminar? (b) Is degree of maieutic frame presence associated with quality of argumentation in a Paideia seminar? and, (c) Is presence of challenging maieutic questions associated with high quality argumentation in a Paideia Seminar?

Is Degree of Maieutic Frame Presence Associated with Quantity of Argumentation in a Paideia Seminar?

I hypothesized that the more Maieutic Frames per 100 Statements a transcript contained, the more Arguments per 100 Statements one would find. Maieutic frame presence was positively and strongly associated with Quantity of Argumentation. The Spearman correlation coefficient between Number of Maieutic Frames per 100 Statements and Number of Arguments per 100 Statements was .786 ($p < .04$). Seminars that had more maieutic frames also had more arguments.

Table 5 shows that seminars 1, 6, and 7 are the ones with the highest Number of Maieutic Frames per 100 Statements and the highest Number of Arguments per 100

Statements. Table 5 also shows that seminars 2, 3, 4, and 5 contain the lowest Number of Maieutic Frames, as well as the lowest Number of Arguments per 100 Statements.

Is Degree of Maieutic Frame Presence Associated with Quality of Argumentation in a Paideia Seminar?

I hypothesized that more Maieutic Frames per 100 Statements in a seminar would be associated with higher Quality of Argumentation. The Spearman correlation coefficient for Number of Maieutic Frames per 100 Statements and Quality of Argumentation was .703 ($p < .08$), indicating a strong, positive correlation. Table 5 shows that the three seminar transcripts with the highest Number of Maieutic Frames per 100 Statements (seminars 1, 6, and 7) also have the highest Quality of Argumentation, 5.4. By contrast, seminars 2, 4, and 5 contain the lowest Number of Maieutic Frames, as well as the lowest Quality of Argumentation: 4.50, 4.80, and 3.00, respectively.

To explore the character of the correlation, I looked at the three transcripts with the highest Number of Maieutic Frames per 100 Statements and examined the quality of the arguments within them. I then looked at the remaining four transcripts that contained the lowest Number of Maieutic Frames per 100 Statements. I present here two transcript excerpts—one demonstrating the association between higher Number of Maieutic Frames per 100 Statements and higher Number of Arguments per 100 Statements, and the other demonstrating the association between lower Number of Maieutic Frames per 100 Statements and lower Number of Arguments per 100 Statements in a transcript. The following excerpt from Transcript 1, which was one of the transcripts with the highest Number of Maieutic Frames per 100 Statements (3.83) shows an example of the high quality of argumentation present in a transcript with more maieutic frame presence:

Jeanne: But could you not learn kindness too? Like, your Mom always told you to be nice or something? *[challenging maieutic question]*

Trevor: OK, well you learn—no, your Mom always tells you to be nice to people, but that's learned moral acts. Things that give you the feeling of goodness personally. But that's learned moral acts. *[claim + data + data + warrant]*

Richard: Right. It's so—that has to, it has to do with your own perception of things. *[backing]* Your take on things, rather than somebody else's. *[data + warrant + claim]*

Al: But if your motive is only for yourself, then that really doesn't have a moral value. *[rebuttal + claim]* To have a moral value, you have to do it, you can't be doing things for like selfish acts. *[claim]* You have to be doing something because it's for something else. *[warrant]*

Doug: You're not doing goodness for something else, you're doing it for somebody else. *[rebuttal]*

Al: But you're doing it for yourself, from kindness. *[rebuttal]*

Doug: But you're also thinking of that person. *[rebuttal]*

Myra: But that's Kant's opinion like, that's really not necessarily the opinion of the majority of people that read it, *[rebuttal + data]* because kindness is considered a moral value. *[warrant]*

Calvin: Like just because you do something and enjoy it, it doesn't mean you're not also doing it for that person. *[claim]*

Rebecca: It doesn't lessen; it doesn't lessen the amount of kindness. *[backing +*

data] Like, I think the problem with this essay is that, he's kind of like put degrees on kindness, *[claim]* and that like, and you have to think about it from two different ways: if you're on the receiving end of it, you probably wouldn't want somebody to do something just because they're like, "Oh, I have to do it, and I don't really want to do it, but I'm going to do it anyway." *[data + warrant]* You're probably going to want somebody who's going to really really want to help you, and who does it just because they want to. *[warrant]* But like, I can kind of understand where he's coming from when he says that doing kind, like being kind, doesn't—I don't agree with him saying it has no moral worth, *[claim]* but I understand what he's saying when he says that, it's like no different from just doing what you want to do. *[claim]*

Calvin: And like, the joy that some people get from doing good deeds is not because they just want to do the good deed to make them feel good. *[backing]* It's more from like they get joy because they realize that the other person appreciates what they did for them. *[data + warrant]*

Al: But then that's not doing it for yourself, that's doing it for the other person, and that's what he's saying. *[rebuttal]*

Calvin: But you still get joy from it. *[rebuttal]*

Rebecca: It's a mixture of both. *[claim]*

(Transcript 1, Kant, Metaphysics of Morals, Highlands Magnet School)

Recall that the structural pattern of an argument—as well as its number of components—usually determines the degree of quality of the argument. More complex

arguments containing several claims, warrants, and rebuttals, and extending over several talk turns are of a higher quality, because they entail alternative or opposing views to the claim, which participants need to assess. The presence of rebuttals enables participants to test each other's assumptions and claims and challenge the argument, rather than accept it unquestioningly (Clark et al, 2007).

Note that the first argument begins with the claim that being nice to people is a learned moral act, contains several data, a warrant, and backings. Al makes a rebuttal stating that "if your motive is only for yourself, then that really doesn't have a moral value." The argument is a level-4 argument because it contains at least a claim with a clearly identifiable rebuttal. Al's rebuttal becomes the claim for a second argument that states that doing something for someone else unselfishly, has moral value, which is backed up by Doug's warrant that "you're not doing goodness for something else, you're doing it for somebody else." Al's argument is a level-5 argument because apart from having all argument components, it brings about several rebuttals: "You're doing it for yourself, from kindness," "But you're also thinking of that person," and "that's Kant's opinion, not necessarily the opinion of the majority of the people that read it." A third argument is brought up by Calvin: "Like just because you do something and enjoy it, it doesn't mean you're not also doing it for that person," backed up by Rebecca's explanations of Kant's views on kindness and how acts of kindness can in fact have moral value. Calvin backs up Rebecca's point, providing the warrant that "the joy that some people get from doing good deeds is not because they just want to do the good deed to make them feel good," which again is rebutted by Al, who brings up another claim that says that "acts of kindness are a mixture of personal satisfaction and the

joy of helping others.” The third argument was classified as level 5 because it displayed an extended argument and contained several rebuttals.

Let’s now compare what we have seen in the transcript with several maieutic frames, to what argumentation looks like in a transcript with few maieutic frames. Recall that the structural pattern of a low-quality argument is different from that of a high-quality one. In low-quality arguments individuals simply make a claim and then may or may not provide supporting data. The following excerpt from Transcript 3, in which students discussed the Greek folk tale Truth and Falsehood, contained fewer Maieutic Frames per 100 Statements and was low in Quality of Argumentation. The following example shows three unconnected, low-quality arguments that stemmed from an opening maieutic question that asked participants to compare truth and falsehood. Students bring forth three claims: truth and falsehood being easily influenced, temptation being an influence, and truth and falsehood being miserable.

The argument in this excerpt begins with Charles’ claim that both truth and falsehood were easily influenced, which backed up Kim’s statement earlier in the transcript. The statements that follow Charles’ claim are either data or backings supporting his claim (“truth looked miserable,” “they were tempted” and textual references indicating where this appears in the text). This argument does not extend beyond backings and data, nor does it contain any rebuttals. Because it contained mostly data and backings, it was classified as a level-2 argument.

Charles: I said they were both easily influenced, that kind of goes with what Kim said. [*claim + backing*] They were both tempted by stuff, of like the ease of getting him stuff. [*data +warrant*]

Gina: Yes, I said that temptation was a factor in both their lives because truthfulness was miserable on the outside, but falsehood was miserable on the inside. [*backing + data*]

Albert: I said they were both miserable. "Truth looked miserable," fourth line, first paragraph. [*backing + data*]

Facilitator: What about falsehood?

Albert: Umm, it doesn't really say that, but....

Facilitator: What makes you think that then?

Albert: the very last line. Truth says, "I'd rather die of hunger." [*data*]

(Transcript 3, "Truth and Falsehood," Highlands Magnet School)

Is Degree of Challenging Maieutic Question Presence Associated with Quality of Argumentation in a Paideia Seminar?

I hypothesized that the presence of challenging maieutic questions would be associated with quality of argumentation. Specifically, I expected greater presence of challenging maieutic questions would produce cognitive conflicts among students, which would force them to test and retest their hypotheses about their interpretations of textual meaning, resulting in higher quality of argumentation. The Spearman correlation coefficient for Number of Challenging Maieutic Questions per 100 Statements and Quality of Argumentation was .954 ($p < .05$), which indicated an extremely strong positive degree of association. When more challenging maieutic questions were asked, arguments exhibited higher quality.

To explore the character of the correlation, I looked at the three transcripts with the highest Number of Challenging Maieutic Questions and examined the quality of the

arguments within them. Table 5 shows that seminar transcripts 1, 6, and 7 contain the highest Number of Challenging Maieutic Questions per 100 Statements, .31, .28, and .32, respectively. Transcripts 1, 6, and 7 also contain the highest quality of argumentation, 5.40 for the three transcripts. As I explained in the section about quality of argumentation, high quality arguments exhibit several claims, warrants, and rebuttals, and extend over several turn talks. Low quality arguments exhibit only one claim and may or may not contain additional data, but no warrants or rebuttals, and are usually brief. Challenging Maieutic Questions are open-ended and point to issues of more complexity in the text, so participants must construct more sophisticated arguments to respond to them. To illustrate the association between degree of challenging maieutic question presence and quality of argumentation, I have selected two excerpts. In the first excerpt, there are three challenging maieutic that lead students to discuss whether there is a contradiction in Aristotle's argument about greatness: (1) Do you think there's a contradiction here? And if so, why, why not? Is there a contradiction that he does not hide his true feelings, but thinks there's nothing worth getting excited and worried about? (2) So if that's a contradiction, what does that tell us about greatness? And Aristotle's definition of greatness? (3) Well if so, he doesn't care about recognition, then why wouldn't he do anything secretly? The three challenging maieutic questions generate three high quality arguments. The first argument is a level 4 argument that states that there would be a contradiction in Aristotle's description of greatness, and is grounded in the fact that Aristotle favors expressing one's true feelings, yet says there's nothing worth feeling excited about, as Judy explains. The second argument—also a level 4 argument—refers to the impact of a contradictory definition of greatness, which is rebutted by Judy's argument: "Well, if so, he doesn't care about recognition, then why wouldn't he do

anything secretly?" Peter and Jim rebut this claim stating that he would not want to lie, that he wants to be straightforward. As a result, a third level-4 argument derives from Judy's rebuttal and the students wrap up a concluding argument that states that either there is no such thing as human greatness, as defined by Aristotle, or that great men are contradictory.

Facilitator: Do you think there's a contradiction here? And if so, why, why not? Is there a contradiction that he does not hide his true feelings, but thinks there's nothing worth getting excited and worried about?
[*challenging maieutic question 1*]

Tim: If you feel strongly, and you want to show it, then you would be excited for it. [*claim*]

Judy: And you wouldn't show your true feelings. [*backing*]

Tim: So that would be a contradiction. [*warrant*]

Sarah: And your true feelings would be that you're excited about it, but then it says that there's nothing getting excited about. [*backing + data + rebuttal*]

Facilitator: So if that's a contradiction, what does that tell us about greatness? And Aristotle's definition of greatness? [*challenging maieutic question 2*]

Jim: It's a contradiction. [*claim*]

Facilitator: Well, what's the impact of that contradiction? [*guiding maieutic question*]

Peter: I guess he doesn't care about greatness. [*claim*] He doesn't care about

recognition. [*data*]

Judy: Well if so, he doesn't care about recognition, then why wouldn't he do

anything secretly? [*rebuttal*]

Peter: Because he [wants to] stay straightforward. [*claim*]

Jim: He doesn't want to lie. [*data*]

Peter: He doesn't want to lie. [*backing*] He doesn't like to do things behind his

back. [*data*]

Judy: Well, it's kind of like one of those things in New York, where some guy

was dressed up like Santa, and he was just handing out money to these

random people, and no one knew who he was. [*data*] And, he was just

giving it, and doing things like that. I mean, if he doesn't care about

having complements, if he just cares to do it for others, then why

won't he do it secretly? [*rebuttal + challenging maieutic question*

3]Why does it have to be known that he had, that he did that

deed? [*restatement of challenging maieutic question 3*]

Peter: He didn't say it has to be known. [*rebuttal*]

Judy: Well, what does secret mean? [*guiding maieutic question*]

Facilitator: What is the implication of the contradiction? [*guiding maieutic*

question]

Tim: Maybe that he's not that great. [*claim*]

Bob: Well, maybe there's, you can't be a great man. [*claim + backing*]

Peter: Maybe he's not the great man he's talking about here. [*claim*] Maybe he's

saying that there are no great men. You can't be it, it's impossible.

[*claim + backing + warrant*]

Tim: Or maybe he's saying that behind every great man, they just contradict themselves. [*claim*]

[several agree, one very loud "yes" chuckling]

Facilitator: That great men are contradictions?

Tim: Yes.

Facilitator: Do you think there are any other contradictions in this passage?

Judy: I think, "The great man will forget or ignore favors done to him, but will remember those he does to others." In paragraph four. [*claim + data*]

(Transcript no. 7, Aristotle, *Ethics*, Book 5 Chapter 1, Caldwell High School).

The second example from Transcript 2 (Charlotta Solomon painting) shows how when questions that are not challenging maieutic questions are asked, arguments are low in quality. In the excerpt, the facilitator asks two guiding questions to lead students into details in the painting, and to force them to clarify their viewpoints. However, their responses are isolated fragments that do not build a consistent, high quality argument.

In the following excerpt, it is evident that the arguments displayed are low in quality. For the most part, the students bring up a series of data that add to Lisa's claim that the picture is very plain. The students tend to repeat what other participants have previously said, and therefore no argument is built. Although the facilitator brings up a guiding question ("Is it a picture or a window?") the argument does not progress. From the point of view of argument quality, then, this argument is an example of a level-1 argument, where only a claim and a few data are present. The excerpt shows how when

maieutic questions that do not challenge student thinking are asked, low quality arguments are produced:

Facilitator: What else do you notice about the room? [*opening maieutic question*]

Lisa: It's very plain. [*claim*]

Facilitator: It's very plain.

David: What's that on the wall?

Lisa: It looks like a picture. [*data*]

Facilitator: Daniel said, "What's on the wall?"

Becki: Picture.

Trey: It's a window. [*data*]

Becki: Picture frame.

Facilitator: Is it a picture or a window? [*guiding maieutic question*]

Trey: It could be a window. A little window. It could be night outside. [*data*]

Becki: It appears to be protruding from the wall. [*data*]

(Transcript 2, painting by Charlotta Solomon)

Chapter Summary

Preliminary analyses yielded no significant differences in variable distributions across the two sets of transcripts, so I decided to collapse the transcripts across schools for the main analyses. Preliminary analyses of variable distributions also showed that the variables performed in accordance with what was expected.

In the main analysis, degree of maieutic frame presence was highly and positively associated with quantity and quality of argumentation. When seminar transcripts contained more Maieutic Frames per 100 Statements, there were more Arguments per 100 Statements

and higher Quality of Argumentation. In addition, degree of presence of challenging maieutic questions was highly and positively associated with quality of argumentation. When seminar transcripts contained more Challenging Maieutic Questions per 100 Statements, arguments exhibited higher Quality of Argumentation.

CHAPTER 5

Conclusions and Discussion

Chapter Overview

The current study has addressed two research questions: (a) is degree of maieutic frame presence associated with degree of quantity and quality of argumentation in a Paideia seminar and (b) is degree of challenging maieutic question presence associated with quality of argumentation? In this chapter, I begin by addressing the limitations of the study. In the Overarching Discussion section, I state the main conclusions, and discuss their meaning. Next, I discuss implications for classroom practice as well as implications for theory and future areas of research.

Limitations

One important limitation of this study is its small sample size. The study included seven transcripts from Paideia seminars that took place in only two high schools in the southeastern United States. Having more seminar transcripts from similar settings would allow us to see replication of results in a larger context. On the other hand, a larger and more diverse set of transcripts (e.g., seminars with different degrees of Paideia experience, with expert and non-expert Paideia facilitators, with mixed-ability students, with other types of texts, such as scientific documents, poetry, music, or mathematical problems) could have allowed me to observe replicability of results in different contexts. The findings of the current study are therefore bound by the sociocultural, socioeconomic, ethnic, and academic characteristics of the participants, the degree of expertise of the facilitators, the texts that

were chosen for each discussion, and the school settings, and cannot be generalized to other populations.

Conclusions

The following conclusions were drawn from the study: a) Degree of maieutic frame presence was highly positively associated with both degree of quantity and quality of argumentation in a Paideia seminar. Seminars that had more maieutic frames had more arguments, and seminars that had fewer maieutic frames had fewer arguments. Seminars that had more maieutic frames had higher-quality arguments, and seminars that had fewer maieutic frames had fewer high-quality arguments. b) Degree of challenging maieutic question presence was highly positively associated with quality of argumentation. When more challenging maieutic questions were asked, arguments exhibited higher quality, and when fewer challenging maieutic questions were asked, arguments exhibited lower quality.

Discussion

In this section, I first discuss the maieutic frame, argumentation, the relationship between degree of maieutic frame presence and degree of quantity of argumentation. Next, I discuss the relationship between degree of maieutic frame presence and quality of argumentation. Finally, I discuss the relationship between degree of challenging maieutic question presence with regard to quality of argumentation.

Overarching Discussion

The maieutic frame. As a preface to the discussion of the conclusions, it is important to point to the viability of the maieutic frame as a construct and to how it proved to be effective in describing the structure of the Paideia seminar discussions analyzed in the current study. The maieutic frame appeared to be a very helpful construct for exploring

conditions in the Paideia seminar that were related to particular outcomes. The maieutic frame is an original construct, and the fact that it makes the structures—conveyers of meaning—visible, enriches our understanding of discussion in general, and contributes to our knowledge about particular outcomes of such discussions. Maieutic frames allow us to visualize the structure of discussions as eminently dialogical and constructive (cf. Bakhtin, 1982, Van Eemeren et al, 2003; Van Eemeren, et al, 2007; Clark et al, 2007). In the case of the current study, maieutic frames allowed us to explore the aspects of a Paideia seminar that contributed to the production of more and better arguments as learners unpacked the meaning of texts.

Argumentation. Researchers who have examined quality of argumentation in previous studies observed that when students engage in classroom discussions, the quality of their written argumentation and the ability to identify argument structure improved (Reznitskaya et al, 2001; Reznitskaya et al, 2007). Only a few other studies have examined and assessed argument quality in oral discourse (e.g., Erduran et al, 2004; Osborne et al, 2004; Duschl et al, 1998), argument causality and networking (Chinn et al, 1998). At the same time, there has been some skepticism regarding the feasibility of accurately determining argument quality (Clark et al, 2007; Erduran et al, 2004), or at least some apprehension with regards to the subjectivity involved in the process of assigning quality levels to arguments. Just as the results of the current study confirm the efficacy of the analytical framework developed by Erduran and colleagues for determining argument quality, the associations between degree of maieutic frame presence and quality of argumentation can further our understanding as to why more high quality arguments occur in certain contexts, and what teachers and seminar facilitators can do to foster their occurrence.

Theoretically, argumentation, is to a great extent sociocultural and sociocognitive in nature. The ways in which participants constructed arguments in the seminars, by elaborating, supporting, or refuting each other's ideas, showed that argumentation is developed dialogically. As Toulmin (1958) noted, argumentation is no longer perceived as confrontational, but as a constructive form of discourse. Contrary to rhetorical debates in which arguments represented opposite perspectives, contemporary theoretical approaches to argumentation stress its value as a vehicle for the development of critical thinking. To date, there are no studies about argumentation in a Paideia seminar, and only a few previous studies have examined the collaborative construction of arguments in other similar discussion contexts such as collaborative reasoning or online chat rooms (e.g., Reznitskaya et al., 2007; Morgan et al, 2003; Chinn et al., 2001).

Degree of Maieutic Frame Presence and Degree of Quantity of Argumentation

As has been mentioned earlier, the kinds of discussions that take place in a Paideia seminar are characterized by having open-ended questions, using textual references to support ideas, producing rigorous, intellectual dialogue, examining challenging and ambiguous texts, and fostering open participation. We now know that the more often these characteristics unfold in a Paideia discussion, the more arguments will be constructed.

The fact that, when more maieutic frames are present in a Paideia seminar, there is more argumentation is important for several reasons. First, the strong positive association between maieutic frame presence and quantity of argumentation indicates that when students discuss texts in certain enactments of Paideia seminar, they do in fact construct arguments both individually *and* collectively. In the seminar transcripts analyzed, it was possible to see how students relied on each other's thinking to develop reasonable claims, and used each

other's prior knowledge to test hypotheses about concepts or reject a claim, or to understand concepts in a new way. The development of reasonable claims, use of prior knowledge, and reliance on each other's thinking was particularly evident in those transcripts that contained more maieutic frames, and less evident in those where fewer maieutic frames occurred.

Examining the structure of maieutic frames can help us understand why more maieutic frame presence is associated with more argumentation. Maieutic frames are built around open-ended maieutic questions that allow participants to explore ideas and respond to them from a personal standpoint. As they explore ideas, students can also anticipate and elaborate arguments to respond to other participants' perspectives. Maieutic frames may provide the necessary scaffold so that these open-ended maieutic questions guide students to look for answers beyond the literal, to identify logical errors, and misinterpretations of the text. Another structural component of maieutic frames that contributes to argument production is elaboration of ideas using references, prior knowledge or experience. The present study supports the belief that students built arguments in response to or as a rebuttal against other participants' claims, and in so doing; they used references as either data or backings to validate their arguments.

In some prior studies researchers had also found connections between some of the features that can be observed in Paideia discussions such as the components of the maieutic frame and the development of more arguments in a discussion or in written discourse. In these studies, discussions about controversial issues, open participation, and use of evidence to support a position were found to be positively correlated with argument production (Reznitskaya, et al, 2007; Reznitskaya et al, 2001; Chinn et al, 1998).

The relationship between maieutic frame presence and quantity of argumentation in Paideia seminars contributes to our understanding of the development of argumentative skills, a feature not yet explored in a Paideia seminar. If now we know that when discussions contain more maieutic frames, more argumentation is produced, then effective Paideia seminars, as well as other forms of classroom discussions with numerous frames, are those in which maieutic frame components abound. As was explained in Chapter 1, maieutic frames weave together aspects that characterize Paideia seminars (use of textual references and prior knowledge to support ideas, interpret, and explain text, foster the occurrence of diverging ideas and new understandings) with the expectation that the discussion will reveal inductive and exploratory talk as a result of open participation. Paideia seminars constitute suitable settings for the observation of argumentation development because the conditions they promote facilitate its development.

One of the reasons that explain the high correlations between Number of Maieutic Frames per 100 Statements and Number of Arguments per 100 Statements, Number of Maieutic Frames per 100 Statements and Quality of Argumentation, and Number of Challenging Maieutic Questions per 100 Statements and Quality of Argumentation is the small sample used in the study. However, high correlations among the variables of interest may also be indicative of the fact that the constructs may not be independent of each other.

Degree of Maieutic Frame Presence and Quality of Argumentation. The fact that maieutic frame presence was associated with quality of argumentation in a Paideia seminar is significant in multiple ways. No studies have examined associations between structural aspects of discussions (such as the components of a maieutic frame) and quality of argumentation. The present study is the first. If more high quality arguments develop when

more maieutic frames occur, fostering the production of maieutic frames may facilitate the production of high quality argumentation. Enhancing maieutic frame presence in classroom discussions means ensuring that students support their ideas with adequate references, prior knowledge or experience, that coherent explanations and interpretations are made, and that discussions are inductive and exploratory. Similarly, it means that teachers will use open-ended maieutic questions frequently to foster discussion, and will relinquish authority if needed, so that open participation prevails. In this way, as more maieutic frames emerge, arguments may also exhibit higher quality.

It seems reasonable to think that there may be certain aspects of the structure of maieutic frames that may be more strongly associated with quality of argumentation. For instance, the fact that maieutic frames may contain divergent ideas and new understandings may be especially linked to the creation of higher quality arguments. When students do not agree in their views and interpretations, they are more likely to engage in argumentation that extends over several talk turns, that displays multiple claims and rebuttals, and that is therefore, of a higher quality level. If, on the contrary, there is more convergent thinking and less skepticism about the meanings of ideas, argumentation will probably be more scarce, and of a lower level of quality.

As was described in Chapter 1, the goal of Paideia seminar discussions is an enlarged understanding of values and ideas. The deeper understanding of values and ideas becomes more authentic when participants are active agents in the process. Maieutic frames are a vehicle for students to accomplish the goal of enlarged understanding and for teachers to guide them in the process. Maieutic scaffolding may have facilitated the emergence of new understandings revealed in argumentation.

In a similar manner, maieutic questions might help students become more engaged in classroom discussions. Maieutic questions may facilitate engagement by addressing ideas and values in a text from the perspective of personal experience and prior knowledge. Thus, participants can rely upon what they already know about a given subject and use that knowledge to begin to unpack textual meaning. Life experiences may also provide a useful background that can allow participants to understand ideas in a text that would otherwise seem too complex to comprehend. Maieutic questions point to universal ideas and values in the text in a way that may contribute to bring students from different academic and cultural backgrounds safely into the discussion.

Degree of Challenging Maieutic Question Presence and Quality of Argumentation. The highly positive association between degree of challenging maieutic question presence and quality of argumentation stresses the importance of the type of questions that are asked in discussions in which the goal is the development of cognitively productive talk. As has been explained in Chapter 1, challenging maieutic questions demand more than simple recall of information. They require participants to assess alternative modes of looking at ideas, to think of hypothetical consequences, and to explore atypical causes. Challenging maieutic questions encourage divergent thinking and, in so doing, engage students in more complex arguments, because cognitive conflicts occur when students try to conciliate their views with those of others in the group. It may therefore be inferred that, as thinking becomes more divergent, argumentation becomes more elaborate because it contains more claims and rebuttals, and therefore shows a better quality.

In prior research there have been a number of studies about the role of questions in discussions (e.g., Commeyras, 1993; Nystrand et al., 2003; Carlsen, 1991; Van Zee, Iwasyk,

Kurose, Simpson, & Wild, 2001). Researchers have emphasized the notion that the kind of questions asked determines the intellectual quality of students' responses largely. The results of the current study are in line with this finding. One of the reasons why challenging maieutic questions were associated with quality of argumentation is that the purpose of challenging maieutic questions is to test students' preconceptions and intellectual constructs particularly when the text that is used for the discussion is complex and ambiguous, and refers to ideas that can be approached from very different perspectives. Challenging maieutic questions were often likely to lead students to question the validity of their own ideas as other participants argued against their claims, or came up with divergent views about issues. Challenging maieutic questions were likely to bring up sociocognitive conflicts (Almasi, 1995) where students had to juggle with opposing viewpoints and accommodate new information with their previous judgments. This intellectual exercise may have required open-mindedness, assessment of credibility, and sensitivity towards other peoples' ideas (Commeyras, 1993), as well as the ability to recognize faulty reasoning or misconceptions.

Although teachers often find it difficult to construct challenging maieutic questions, it is important to be aware of the potential these questions have to trigger high-quality argumentation in student discussions. More frequent use of challenging maieutic questions not only contributes to the quality of the discussions, but as prior research suggests, it also fosters motivation and engagement in classroom discussion (Chinn et al, 2001; Clark et al, 2003; Erduran et al, 2004; Morgan et al, 2003). Similarly, the use of maieutic frames and maieutic questions may assist in the distribution of power, not only between the students and the teacher, but also among students in the discussion, creating a more democratic and cooperative intellectual environment.

Implications

In the following section, I discuss the implications of the current study for classroom practice, theory development, and areas of future research.

Implications for Classroom Practice

The findings in the current study suggest that teachers would benefit from knowing what a maieutic frame is and how to identify it. First, the findings demonstrate that argumentation does happen in settings such as the Paideia seminar, when students engage in a discussion about a text, and that the discussions students engage in are about not only impressions or opinions of what is being said in the text, but about ideas that are explored in depth in order to make claims, establish warrants, or make rebuttals. Second, it shows that seminar discussions can be effective contexts to model and teach argumentation, a strategy that, according to national assessment records, many students lack, and is often not explicitly taught in schools (NAEP, 2002). Teachers can therefore learn to use seminars effectively so that more maieutic frames would be present, and therefore more argumentation would emerge.

Third, if teachers can identify maieutic frames, they will know what needs to happen in a discussion so that more maieutic frames are present, and therefore more and better argumentation may be created.

The fact that discussion transcripts can be examined by formalizing the discussion (i.e., by identifying maieutic frames) has important implications for teaching and learning. By making the maieutic nature of seminar dialogue visible, teachers may identify the moments in which more and better argumentation is produced, and determine what contributes to the presence of more maieutic moments in the conversation. For instance,

teachers may observe that when texts are connected to prior experience or knowledge, better arguments are created. Therefore, they can structure their maieutic questions in a way that they will lead students to make such connections.

Similarly, teachers could benefit from learning what high-quality and low-quality argumentation are, and how to identify them in classroom discussion. Researchers have emphasized the fact that high-quality argumentation needs to be explicitly taught (Erduran et al, 2004; Kuhn, 1992; Reznitskaya et al., 2007) and that one of the best ways to develop it is by observing teachers and peers as they engage in argumentative discourse. Researchers have also observed the snowballing effect of high-quality argumentation when it happens in classroom discussions (Anderson et al., 2001). When students watch other students develop complex arguments, they see these arguments as effective tools of persuasion and tend to imitate them.

Teachers would also benefit from knowing how to ask challenging maieutic questions and understanding their role in the production of high-quality argumentation. As prior research has indicated, the cognitive quality of classroom discourse depends upon the quality of the questions teachers and students ask (e.g., Nystrand, 2006). Challenging maieutic questions address fundamental issues in a text but require the teacher's ability to identify complex issues in a text, as well as the ability to create questions that are sufficiently open-ended and intellectually demanding.

Implications for Theory

The findings in the current study support sociocultural and sociocognitive underpinnings about the importance of the social dimensions of cognition, but they also add emphasis on an important aspect of authentic learning—its ability to emerge from the

learners when the adequate scaffolding is provided. As Vygotsky theorized, internalization occurs when behaviors that have been acquired through external social interaction “grow into the mind,” (Bodrova & Leong, p. 21) to become higher mental functions. The association between maieutic frame presence and quantity and quality of argumentation, as well as the association between degree of challenging maieutic question presence and quality of argumentation are examples of the powerful relationship between the social context and argument construction.

Implications for Future Research

New avenues for research may enrich our understanding of the role of maieutic frames in classroom discourse. One area that seems especially interesting is to examine maieutic frame presence in other discussion formats beyond Paideia seminars. For instance, it would be interesting to observe whether maieutic frames can be identified in collaborative reasoning, literature circles, philosophy for children, or other forms of less structured classroom discussions. Comparing maieutic frame presence in different text discussion formats could provide important insights that will allow us to better understand oral discussion as a socially constructed learning experience.

Along the same lines, understanding how maieutic frames unfold in non-literary contexts is another issue that could be addressed from a research perspective. For instance, how are maieutic frames associated with quantity and quality of argumentation in discussions about science, mathematics, or history? It may be interesting to explore whether maieutic frame presence has any relationship with developmental aspects of cognition such as the ability to predict or make inferences.

Another research area that seems particularly interesting to examine has to do with the extent to which maieutic frame presence may foster student engagement in classroom discussions. The way in which maieutic frames are structured and, more specifically, the way in which maieutic questions address discussion topics may contribute to enhanced student engagement in discussions, regardless of student background. Future research might address whether it is possible to draw convincing evidence about student engagement in classrooms discussions beyond the amount of talk turns and the number of students participating in a discussion. Likewise,

Other aspects for research might include examining teacher expertise and roles as discussion facilitator with regard to maieutic frame presence and argument, potential associations between maieutic frame presence and other critical thinking skills, maieutic frame presence in written discourse and argumentation, and sociocultural factors influencing the emergence of maieutic frames.

Knowing how many arguments are produced in each maieutic frame can be used to compare argument production across various seminars, over time, in different content areas, or among facilitators with different levels of expertise. A comparison of argument production across seminars may help determine what facilitates or inhibits the development of more maieutic frames and, therefore, more arguments. For example, in the seminars in the present study, it was observed that when students discussed philosophical texts, more maieutic frames and more arguments occurred, whereas when other kinds of texts were discussed, fewer maieutic frames and fewer arguments occurred. Although it cannot be generalized that philosophical texts will always produce more maieutic frames and more arguments than other

kinds of texts, the observation might suggest that certain texts can contribute more than others to the development of argumentation.

It would be interesting to develop future research that examines maieutic frame presence and quantity and quality of argumentation within a larger and more diverse set of transcripts. Some of the issues that could be examined are: 1) Are there similar numbers of maieutic frames in seminars with younger participants? 2) Would there be similar associations between maieutic frame presence and quantity and quality of argumentation in transcripts in which texts from other subject areas had been used? 3) Would there be similar associations between presence of challenging maieutic questions and high quality of argumentation if other kinds of texts had been discussed, or younger children had participated in the discussion? Another issue that could be examined with a more diverse set of transcripts is whether seminars with less experienced facilitators exhibited similar numbers of maieutic frames, arguments quality of argumentation.

Determining whether there are any relationships between specific maieutic frame components (i.e., use of references and prior knowledge to support ideas, making connections across texts, providing explanations and interpretations and constructing divergent ideas and new understandings) and argument components (claims, data, warrants, backings, qualifiers and rebuttals) could expand our understanding of the relationships that the current study has explored.

Finally, it is important to point to the fact that the concept of maieutic frames and maieutic questions may be useful to examine a wide variety of classroom discussion contexts, not only the Paideia seminar. As has been mentioned in Chapters 1 and 2, maieutic frame components can also be found in other forms of discussion such as Collaborative

Reasoning, Philosophy for Children, instructional conversations, and general literary discussions. Similarly, maieutic questions are also used in these discussion formats and are not a prerogative of Paideia seminars only.

APPENDICES

Appendix A

Rules for Transcription of Seminars

1. Seminars were transcribed from audiotapes and labeled based on location, time, seminar text, or title for proper identification.
2. Pauses, noises, and other interruptions in the audio were signaled with brackets []. Inaudible utterances were transcribed as [inaudible].
3. Transcriber's comments (e.g., "overlapping") are put in brackets [].
4. Speaker identification, whenever possible, was based on participant seating during the seminar session (as described in the seminar map). If no identification was possible, transcriber would label them as "unidentified boy" or "unidentified girl."
5. Teacher's talk turns were identified with a T.
6. Commas were used for pauses in speakers' speech. Dashes – were used for longer pauses.
7. Interjections and utterances such as "er", "uh", "um", etc., were not transcribed. The transcriber used punctuation to denote the tempo of the speakers' speech.
8. If someone was interrupted while speaking, the text was left with a dash – at the end of the utterance.
9. When two people spoke at once, the transcriber tried to capture as much as possible of the conversation, and wrote [overlapping].

Appendix B

Rules for the Determination of Statements

1. Single-word utterances will be considered statements and will therefore be coded as such when they convey an implicit question or response. For example, in the following excerpt, the question “why” will be coded as a statement because it entails the previous question “Why do you not agree with Kant that they are fulfilling their moral duty?”

Excerpt: T: /According to Kant--not you-- according to Kant, are they
fulfilling their moral duty?/

C: {No}

T: /Why?/ (Transcript November 10, 2004)

2. Single-word interjections will not be considered statements and will therefore not be coded.
3. Single-word expressions of agreement or disagreement will not be considered statements and will not be coded. However, the independent clause following the expression of agreement or disagreement will be considered a statement:

Example: A: {No.} /If you didn't like doing it, but you knew it was good,
and you did it, you would feel a lot better./ (Transcript November 10,
2004)

4. Utterances that signal interruptions, manage discipline, or ask participants to repeat information, will not be considered statements.
5. Non-statements will be set between {} to separate them from statements.

Appendix C

Coding Sheet for Identification of Maieutic Frames

Transcript 1		MQ	TR	CT	PK	IN	EX	DI	NU
Frame number	Items								
1	According to Kant—not you—according to Kant, are they fulfilling their moral duty?	√							
	He describes it as that they're doing it for themselves						√		
	It says, when done simply from kindness, it has no moral worth at all.		√						
	Yes, line 10. Line 10 is where he says [].		√						
	Wait, so if I like walk up to a [], hand him a couple of bucks, that has no moral value whatsoever?							√	
2	Do you want to do that, or are you doing that because you should do that?	√							
	I'm doing it because I understand that it's for his better						√		
	But he's not just/ you wouldn't just be doing it because somebody said that's what's he's supposed to do.							√	
	He's not just following orders, because that's meaningless, it doesn't have any heart, it doesn't show any kind of compassion, it is just doing something because you should.						√		

Explanation of the codes:

a) *Textual references* (TR) will be any statements in which students elaborate ideas using direct quotes from the text, or mentioning page, paragraph, or line numbers as reference to support their argument.

b) *Connections across text* (CT) will be those elaborations in which students discuss an idea using connections between different sections or passages of the text, without the use of direct quotes or references. These connections relate characters, events, or arguments within a particular text. Connections across different texts (e.g., the text being discussed and any other text read or discussed in class prior to the seminar) will also be coded.

c) *Elaboration based on prior knowledge and/or experience* (PK), refers to those elaborations of ideas in which students rely on what they already know or on personal experience to expand an argument.

d) *Interpretations* (IN), refers to the ability to express an idea developed by the author, in one's own words.

e) *Explanations* (EX) refers to students' ability to give reasons as to why events happen and the ways in which arguments unfold in a text. Explanations require learners to provide a rationale for what the text states.

f) *Diverging ideas* (DI) refers to students' expression of ideas that differ from those presented by other students or developed by the author in the text.

g) *New understandings* (NU) refer to insights, discoveries, or new perspectives that emerge in students' verbal interactions: new outlooks on a particular concept, alternative reasons to explain a situation, or co-construction of ideas.

Appendix D

Coding Sheet for Degree of Quantity of Argumentation

	Argument #	Claim	Data	Warrant	Backing	Qualifier	Rebuttal	Ø
/What do you mean by that?/								√
/Well how does that prove that, I mean falsehood could have been miserable		√						
but do you think that, or know it?/								√
/Because he said, because he's, because truth is saying that falsehood is in worse shape than he is. /			√					
/Because, he'd rather die of hunger than be like falsehood. /			√					
/But a lot of times like people don't really have the same opinion about a lot of stuff. /					√			
/Like they can be completely comfortable doing something, like doing something that someone else would never do./					√			
/ I don't think falsehood was miserable at all./		√						
/It said he burst out laughing./			√					
/ he was lying to himself. /			√					
/I personally think that falsehood was really happy./	1	√						
/Why do you say that?/								√
/ Well, doing what he does gets free food worth one hundred dollars./			√					
/ And he's happy./				√				
/ He laughs after he does things./					√			
/Apparently he's impressing a lot of guests./					√			

/But laughter, a lot of times, a mask of something, like an insecurity on the one side, number one. /							√	
/And number two, just because you're prosperous on the outside doesn't mean you're happy on the inside./			√					
/ He says to truth that, you could come with me, you'll be happy./					√			
/ So, it kind of implied that he's happy./					√			
/I agree with Rita, because, just because he gets what he wants, doesn't mean he's fulfilled./	2	√						
/ He keeps wanting more and more and more./			√					
/ And people like that don't get fulfilled, because they get—/				√				
/And because falsehood keeps deceiving more and more and more, he's never really sad./					√			
/He might not have much of a conscience to make him feel sad./					√			
/ Because he keeps doing wrong./				√				
/ He's like in an eternal state of bliss./				√				
/You know what Jan was saying, falsehood, you can kind of tell that he's done it before, because everything looks new [?]./					√			
/ So he must learn something from the pleasure of it, to keep on doing it./					√			
/But then again, he is falsehood./					√			
Total number of arguments:	2							

Degree of Quality of Argumentation

Argument Type Argument #	Level 1	Level 2	Level 3	Level 4	Level 5
1			√		
2		√			
Total Number of arguments per category:		1	1		

Appendix E

Analytical framework used in for assessing the quality of argumentation. (From Osborne, Erduran, and Simon, 2004)

Level 1: Level 1 argumentation consists of arguments that are a single claim versus a counterclaim or a claim versus claim.

Level 2: Level 2 argumentation has arguments consisting of claims with either data, warrants, or backings, but do not contain any rebuttals.

Level 3: Level 3 argumentation has arguments with a series of claims or counterclaims with either data, warrants, or backings with the occasional weak rebuttal.

Level 4: Level 4 argumentation shows arguments with a claim with a clearly identifiable rebuttal. Such an argument may have several claims and counterclaims as well, but this is not necessary.

Level 5: Level 5 argumentation displays an extended argument with more than one rebuttal.

REFERENCES

- Adler, M. (1982). *The Paideia Proposal: An Educational Manifesto* (On Behalf of the Paideia Group) New York, Collier Books, Macmillan Publishing Company, 1982.
- Adler, M. (1984). *The Paideia program. An educational syllabus*. New York: The Institute for Philosophical Research.
- Adler, M. (1998). *The Paideia proposal*. New York: Touchstone Books.
- Akmajian, Demers, Farmer, & Harnish (1995). *Linguistics. An introduction to language and communication*. Cambridge, MA: The MIT Press.
- Almasi, J. (1995). The nature of fourth graders' sociocognitive conflicts in peer-Led and Teacher-Led Discussions of Literature. *Reading Research Quarterly*, Vol. 30, No.3, 314-351.
- Almasi, J., & Gambrell, L. (1994) *Lively discussions!* fostering engaged reading. Newark, DE: International Reading Association.
- Almasi, J.F. (1996). A new view of discussion. In L.B. Gambrell & J.F. Almasi (Eds.), *Lively discussions: Fostering engaged reading* (pp. 2-24). Newark, DE: International Reading Association.
- Alvermann, D. & Hayes, J (1989) Classroom Discussion of Content Area Reading Assignments: An Intervention Study *Reading Research Quarterly*, Vol. 24, No. 3, 305-335.
- Alvermann, D., O'Brien, D., & Dillon, D. (1990). What teachers do when they say they're having discussions of content area reading assignments? A qualitative analysis. *Reading Research Quarterly*, 25, no. 4, 296-322.
- Alvermann, D. E.; Young, J.; Weaver, D. (1996). Middle and high school students' perceptions of how they experience text-based discussions: a multicase study *Reading Research Quarterly*, 1996, 31, 244-267.
- Anderson, R., Nguyen-Jahiel, K., McNurlen, B., Archodidou, A., Kim, S., Reznitskaya, A., Tillimanns, M., & Gilbert, L. (2001). The snowball phenomenon: Spread of ways of talking and ways of thinking across groups of children. *Cognition and Instruction*, 19 (1) 1-46.
- Andriessen, J. Baker, M., & Suthers, D. *Arguing to Learn: Confronting Cognitions in Computer-Supported Collaborative Learning Environments*, Kluwer Academic Publishers, Norwell, MA, 2003.

- Applebee, A.; Burroghs, & Stevens (1994). Shaping conversations: a study of continuity and coherence in high school literature curricula. National Research Center on Literature Teaching and Learning, Albany, New York.
- Applebee, A., Langer, J., Nystrand, M., & Gamoran, M. (2003). Discussion-Based Approaches to Developing Understanding: Classroom Instruction and Student Performance in Middle and High School English. *American Education Research Journal*, 30, 3, 685-730.
- Au, K. & Mason, J. M. (1981). Social organizational factors in learning to read: The balance of rights hypothesis. *Reading Research Quarterly*, 17, 115-152.
- Bakhtin, M. (1981). *The dialogic imagination: four essays*. University of Texas Press, Austin.
- Bellack, A. Kliebard, H., Hyman, R., & Smith, F. (1966). *The language of the classroom*. New York: Teachers College Press.
- Billings, L. & Fitzgerald, J. (2002) Dialogic Discussion and the Paideia Seminar. *American Educational Research Journal*, 907-941.
- Billings, L. & Roberts, T. (2006). Planning, Practice, and Assessment in the Seminar Classroom. *The High School Journal*, 90 (1), 1-8.
- Bloom, B. (with Alexrod, J. et al.). *Teaching by Discussion*. Chicago, IL. University of Chicago.
- Bloom B. (1954). The thought processes of students in discussion. In S. J. French (Ed.) *Accent on teaching: Experiments in general education* (pp. 23-46). New York: Harper.
- Bodrova, E. & Leong, D. (1995). *Tools of the Mind: The Vygotskyan approach to early childhood education*. Englewood Cliffs, NJ: Merrill.
- Bowker, N. (2000). Chat programs as forums for creating student-directed narratives. *Access*, 14(2), 19-21.
- Brandon, D. & Hollingshead, A. (1999). Collaborative Learning and computer-supported groups. *Communication Education*, 48, p. 109-123.
- Bridges, D. (1979). Education, democracy, and discussion. Windsor, England. National Foundation for Educational Research.
- Carlsen, W. (1991). Questioning in classrooms. A sociolinguistic perspective. *Review of Educational Research*, 61, 2, 157-178.

- Cazden, C.B. (1988). *Classroom discourse: The language of teaching and learning*. Portsmouth, NH: Heinemann.
- Chambliss, M., & Murphy, K. (2002). Fourth and fifth graders representing the argument structure in written texts. *Discourse Processes*, 34 (1), 91-115.
- Chinn, C., Anderson, R. C., & Waggoner, M. (2001). Patterns of discourse during two kinds of literature discussion. *Reading Research Quarterly*, 36, 378-411.
- Chinn, C. A., & Anderson, R. C. (1998). The structure of discussions that promote reasoning. *Teachers College Record*, 100, 315-368.
- Clark, A., Anderson, R.C., Kuo, L., Kim, I., Archodidou, A., & Nguyen-Jaljel, K. (2003). Collaborative reasoning. Expanding ways for children to talk and think in school. *Educational Psychology Review*, 15, 181-198.
- Clark, D., & Sampson, V. (2007). Assessing dialogic argumentation in online environments to release structure, grounds, and conceptual quality. *Journal of Research in Science Teaching* (in press).
- Clark, D., Sampson, V., Weinberger, A., & Erkens, G. (2007). Analytic frameworks for assessing dialogic argumentation in online learning environments. *Educational Psychology Review*, 19:343-374.
- Commeyras, M. & DeGross, L. (1998). Literacy professionals' perspectives on professional development and pedagogy: a United States Survey. *Reading Research Quarterly*, 33, 4, 434-472.
- Commeyras, M. (1993). Promoting critical thinking through dialogical-thinking reading lessons. *The Reading Teacher* 46, 486-494.
- Copeland, M. (2004). *Socratic Circles: Fostering Critical and Creative Thinking in Middle and High School*. Portland, Maine. Stenhouse Publishers.
- Dawe, H. C. (1934). An analysis of 200 quarrels of preschool children. *Child Development*, 5, 139-157.
- De la Torre, A. (2003). El método socrático y el modelo de Van Hiele. *Letras Matemáticas*, Vol. 24, 99-121.
- Duffy, G. (1981). Teacher effectiveness research: Implications for the reading profession. In M. Kamil, (Ed.) *Directions in reading: Research and instruction. Thirtieth yearbook of the National Reading Conference* (pp. 113-136). Washington, D.C.: National Reading Conference.

- Durkin, D. (1978-79). What classroom observations reveal about reading comprehension. *Reading Research Quarterly*, 14, 491-533.
- Duschl, R. Ellenbogen, K., & Erduran, S. (1999). Promoting argumentation in Middle School science classrooms: A Project SEPIA Evaluation. Paper presented at the Annual Association for Research in Science Teaching. Boston, MA, March, 28-31.
- Eeds M., & Wells D. (1989). Grand Conversations: an exploration of meaning construction in literature study groups. *Research in the teaching of English*, 23, 4-29.
- Eichinger, D.C., Anderson, C.W., Palincsar, A.S., & David, Y.M. (1991). An Illustration of the roles of content knowledge, scientific argument, and social norms in collaborative problem solving. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.
- Elder, L., & Paul, R. (1998). Critical thinking: Developing intellectual traits. *Journal of Developmental Education*, 21(3), 34-35.
- Erduran, S., Simon, S., & Osborne, J. (2004). TAPping into argumentation: Developments in the application of Toulmin's argument pattern for studying science discourse. *Science Education*, 88, 915-933.
- Felton, M. & Kuhn, D. (2001). The development of argumentative discourse skills. *Discourse Processes*, 32, 135-153.
- Gamoran, A., & Kelly, S. (2001). Tracking, instruction, and unequal literacy in secondary school English. In M. T. Hallinan, A. Gamoran, W. Kubitschek, and T. Loveless (Eds.), *Stability and Change in American Education: Structure, Processes and Outcomes*. Clinton Corners, NY: Eliot Werner Publications.
- Goodlad, J. I. (1984). *A place called school: Prospects for the future*. New York: McGraw-Hill.
- Guszack, R. (1967). Teacher questioning and reading. *The Reading Teacher*, 21, 227-234.
- Haroutunian-Gordon, S. (1991). *Turning the Soul. Teaching through conversation in the high school*. Chicago, IL: University of Chicago Press.
- Haroutunian-Gordon, S. (1998). A study in reflective thinking: patterns in interpretive discussion. *Educational Theory*, 48 (1), 33-58.
- Heath, S.B. (1983). *Ways with words. Language, life and work in communities and classrooms*. Cambridge, UK: Cambridge University Press.
- Jaeger, W. (1965). *Paideia. The Ideals of Greek Culture Volume I: Archaic Greece*. New York: Oxford University Press.

- Kim, S., Anderson, R.C., McNurlen, B., Archodidou, A., Nguyen, K.T., Tillmanns, M., & Reznitskaya, A. (2000). Students' concepts of discussion. Champaign, IL: Center for the Study of Reading.
- Kuhn, D. (1991). *The skills of argument*. Cambridge: Cambridge University Press.
- Kuhn, D. (2001). How Do People Know? *Psychological Science* 12 (1), 1–8.
- Kuhn, D., Shaw, V. & Felton, M. (1997). Effects of dyadic interaction on argumentative reasoning. *Cognition and Instruction*, 15(3), 287-316.
- Kuhn, D., & Udell, W. (2003). The Skills of Argument. *Child Development*, 74 (5), 1245-1260.
- Langer, J. (1992). Rethinking literature instruction. In J.A. Langer (Ed.) *Literature Instruction: A focus on student response* (pp. 35-83). Urbana, IL: National Council of Teachers of English.
- Langer, J. (1995). Envisioning *Literature*. *Literary understanding and literature instruction*. NY: Teacher's College Press and International Reading Association.
- Langer, J.A. (2001). Beating the odds: Teaching middle and high school students to read and write well. *American Educational Research Journal*.
- Leigh F. (2007). Platonic dialogue, maieutic method, and critical thinking *Journal of Philosophy of Education* 41 (3) , 309–323.
- Luecht, R.(1999). *Evaluating the Paideia program in Guilford County Schools*: Center for Educational Research and Evaluation, University of North Carolina, Greensboro.
- Luecht, R.(2000). *Evaluating the Paideia program in Guilford County Schools*: Center for Educational Research and Evaluation, University of North Carolina, Greensboro.
- Luecht, R.(2001). *Evaluating the Paideia program in Guilford County Schools*: Center for Educational Research and Evaluation, University of North Carolina, Greensboro.
- Maloney, J. & Simon, S. (2006). Mapping children's discussions of evidence in Science to assess collaboration and argumentation. *International Journal of Science Education*, 28 (15), 1817-1841.
- Marshall, J., Smagorinsky, & Smith, M. (1995). *The language of interpretation: Patterns of discourse in discussions of literature*. Urbana, IL: National Council of Teachers of English.

- Means, M. & Voss, J. (1996). *Who reasons well? Two studies of informal reasoning among children of different grade, ability, and knowledge levels*. *Cognition and Instruction*, 14 (2), 139-178.
- Mercer, N., Wegerif, R., & Dawes, L. (1999). Children's talk and the development of reasoning in the classroom. *British Educational Research Journal*, Vol. 25 (1), 95-112.
- Mercer, N. & Littleton, K. (2007). *Dialogue and the Development of Children's Thinking: a sociocultural approach*. New York, NY: Routledge.
- Mondolfo, R. (1998). *Socrates*. Buenos Aires: Argentina. Editorial Eudeba.
- Morgan W. & Beaumont, G. (2003). A dialogic approach to argumentation: using a chat room to develop early adolescent students' argumentative writing. *Journal of Adolescent and Adult Literacy*, 47: 2 146-167.
- Murphy, P. K., & Edwards, M. N. (2005, April). What the studies tell us: A meta-analysis of discussion approaches. In I. Wilkinson (Chair), Making sense of group discussions designed to promote high-level comprehension of texts. Symposium presented at the annual meeting of the American Educational Research Association, Montreal, Canada.
- NAEP. (2002). *The nation's report card: Reading 2002*[Online]. Available: <http://nces.ed.gov/nationsreportcard/pdf/main2002/2003521.pdf>
- Nussbaum, M. (2002). The process of becoming a participant in small-group critical discussions: A case study. *Journal of Adolescent and Adult Literacy*, 45, 488-498.
- Nystrand, M., Gamoran, A., Kachur, R., & Pendergast, C. (1997). *Opening Dialogue. Understanding the dynamics of language and learning in the English classroom*. New York: Teachers College Press.
- Nystrand, M., Gamoran, A. & Carbonaro, W. (2001). *The Production of Achievement Inequality in High School English*. New York: Teachers College Press
- Nystrand, M. & Gamoran, A., (2003). *Towards a Rhetoric of Everyday Life: New directions in research on writing, text, and discussions*. Madison, WI: University of Wisconsin Press.
- Nystrand, M., Wu, L., Gamoran, A., Long, D., & Zeiser, S. (2003). Questions in Time: Investigating the Structure and Dynamics of Unfolding Classroom Discourse. *Discourse Processes*, 35, 135-198.
- Nystrand, M. (2006). Research on the role of classroom discourse as it affects reading comprehension. *Research in the Teaching of English*, 40, 392-411.

- O'Flahavan, J. F., & Almasi, J. F. (1991, December). A comparative study of the interpretive roles and intertextual foci found in 2nd, 3rd, and 4th grade peer discussion about literature. Paper presented at the 41st Annual Meeting of the National Reading Conference, Palm Springs, CA.
- O'Flahavan, F. (1989). An exploration of the effects of participant structure upon literacy development in reading group discussions. Unpublished doctoral dissertation. University of Illinois, Urbana-Champaign.
- O'Flahavan, J.F., Stein, C., Wiencek, J., & Marks, T. (1992). Intellectual development in peer discussions about literature: An exploration of the teacher's role (Final Report). Urbana, IL: National Council of Teachers of English.
- Orsolini, M. (1993) Dwarfs do not shoot: An analysis of children's justifications. *Cognition and Instruction* 11, 281-97.
- Osborne, J., Erduran, S., & Simon, S. (2004). Enhancing the quality of argumentation in science classrooms. *Journal of Research in Science Teaching*, 4 (10), 994-1020.
- Parker, W.C., & Hess, D. (2001) Teaching with and for discussion. *Teaching and Teacher Education*, 17 (6) 273-289.
- Paul, R. W. (1986). Dialogical thinking: Critical thought essential to the acquisition of rational knowledge and passions. In J. B. Baron & R. J. Sternberg (Eds.), *Teaching thinking skills: Theory and practice* (pp. 127-148). New York: Freeman.
- Perkins, D. (1985). Post-primary education has little impact upon informal reasoning. *Journal of Educational Psychology*, 77, 563-571.
- Polite, V. & Adams, A. (1996). Improving critical thinking through Socratic seminars *Spotlight on student success*. No. 110.
- Pontecorvo, C. & Girardet, H. (1993). Arguing and reasoning in understanding historical topics. *Cognition and Instruction*, 11, 365-395.
- Resnick, L., Salmon, M., Zeitz, M., Wathen, S., & Holowchack, M. (1993). Reasoning in Conversation. *Cognition and Instruction*, 11 (3 & 4), 347-364.
- Reznitskaya, A., Anderson, R. C., McNurlen, B., Nguyen-Jahiel, K., Archodidou, A., & Kim, S. Y. (2001). Influence of oral discussion on written argument. *Discourse Processes*, 32, 155-175.
- Reznitskaya, A., & Anderson, R. C. (2002). The argument schema and learning to reason. In C.C. Block, & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 319-334). New York: The Guilford Press.

- Reznitskaya, A., Anderson, R., & Kuo, L. (2007). Teaching and learning argumentation. *The Elementary School Journal* 107 (5), 450-472.
- Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In: Wertsch, J. B., del Rio, P., and Alvarez, A.(eds.), *Sociocultural Studies of Man*, Cambridge University Press, Cambridge, England, 139–164.
- Rosenblatt, L. (1978). Rosenblatt, L.M. (1994). *The reader, the text, the poem: The transactional theory of the literary work*. Carbondale: Southern Illinois University Press.
- Rosenblatt, L. (2005). *Making meaning with texts*. Portsmouth, NH: Heinemann.
- Rottenberg, A. (2000). *Elements of Argument. A text and a reader*. Boston, MA: Bedford/St. Martin's.
- Sandora, C., Beck, I., & McKeown, M. (1999). A comparison of two discussion strategies on students' comprehension and interpretation of complex literature. *Reading Psychology*, 20, 177-212.
- Sarason, S. (1983). *Schooling in America: Scapegoat and salvation*. New York: Free Press.
- Schunk, D.H. (1998). Peer modeling. In K. Topping and S. Ehly (Eds.) *Review of Educational Research*, 57, 149-174.
- Sedley, D. (1996). Three Platonist Interpretations of the Theaetetus, in: C. Gill and M. M. McCabe (eds.), *Form and Argument in Late Plato* Oxford: Oxford University Press.
- Sedley, D. (2004) *The Midwife of Platonism: Text and Subtext in Plato's Theaetetus* . Oxford, UK, Clarendon Press.
- Simon, S., Erduran, S. and Osborne, J. (2006). Learning to teach argumentation: Research and development in the science classroom. *International Journal of Science Education*, 28 (2-3), 245-260.
- Spiegel, D. L. (2005). *Classroom Discussion: Strategies for Engaging All Students, Building Higher-Level Thinking Skills, and Strengthening Reading and Writing Across the Curriculum*. New York: Scholastic.
- Stein, N. & Albro, E. (2001). The Origins and Nature of Arguments: Studies in Conflict Understanding, Emotion, and Negotiation. *Discourse Processes*, 32, 2, 113-133.

- Stein, N. L., & Miller, C. A. (1993). The development of memory and reasoning skill in argumentative contexts: evaluating, explaining, and generating evidence. In R. Glaser (Ed.), *Advances in instructional psychology* (pp. 285-335). Hillsdale N.J.: Erlbaum.
- Stubbs, M. (1983). *Discourse Analysis. The Sociolinguistic Analysis of Natural Language*. Worcester, U.K.: The University of Chicago Press.
- Suthers, J., Toth, E., & Weiner, A. (1997). An Integrated Approach to Implementing Collaborative Inquiry in the Classroom. Proceedings of Computer Supported Collaborative Learning (CSCL'97), pp. 272-279, December 10-14, 1997, Toronto.
- Teasley, S. (1995). The role of talk in children's peer collaborations. *Developmental Psychology*, 31 (2), 207-220.
- Tharp R. & Gallimore, R. (1998). *Rousing Minds to Life: Teaching, learning, and schooling in social context*. Cambridge, NY: Cambridge University Press.
- Tomasello, M. (1999). *The Cultural Origins of Human Cognition*. Harvard University Press.
- Toulmin, S. (1958). *The Uses of Argument*. London, U.K. Cambridge University Press.
- van Eemeren, F.H., Houtlossent, & Snoeck, F. (2007). *Argumentative Indicators in Discourse: A Pragma Dialectical Study*. Dordrecht, The Netherlands: Springer.
- van Eemeren, F.H. & R. Grootendorst (2003). A Pragma-dialectical Procedure for a Critical Discussion. *Argumentation* 17, 365-386.
- van Zee, E.H., Iwasyk, M., Kurose, A., Simpson, D., & Wild, J. (2001). Student and teacher questioning during conversations about science. *Journal of Research in Science Teaching*. 38, 159-190.
- Voss, J. F., Blais, J., Means, M. L., Greene, T. R., & Ahwesh, E. Informal reasoning and subject matter knowledge in the solving of economics problems by naive and novice individuals. *Cognition and Instruction*, 1986, 3, 269-302.
- Voss, J. F., & Means, M. L. (1991). *Learning to reason via instruction in argumentation*. *Learning and Instruction*, 1, 337-350.
- Voss J. F. and Van Dyke, J. A.: 2001, Argumentation in psychology: Background comments, *Discourse Processes*, 32, 89-111.
- Waldrip, D., Marks, W., & Estes, N. (1993). Magnet school policy studies and evaluations International Research Institute on Educational Choice, University of Houston, College of Education, Houston

- Walton, D., & Krabbe, E. (1995). *Commitment in dialogue: Basic concepts of interpersonal reasoning*. Albany: State University of New York Press.
- Walton, D. (1998). *The New Dialectics. Conversational Contexts of Argument*. Toronto: Canada. University of Toronto Press.
- Wells, G. & Mejia Arauz, R. (2006). Dialogue in the classroom. *The Journal of the Learning Sciences* 15(3), 379-428.
- Wersch, J. (1995). *Voices of the mind: a sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.
- Whaley, J.F. (1981). Reading expectations for story structures. *Reading Research Quarterly*, 17 (1), 90-110.
- Wood, T. (1999) Creating a Context for Argument in Mathematics Class
Journal for Research in Mathematics Education, Vol. 30, No. 2. 171-191.