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High Stakes Policy and Mandated Curriculum: A Rhetorical Argumentation Analysis to Explore the Social Processes That Shape School Leaders' and Teachers' Strategic Responses

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Abstract

Several social processes guide and shape how school actors engage with high stakes state and district policies relative to mandated curriculum and instruction. In this article, we use rhetorical argumentation analysis to explore how stakeholders mobilize resources through argumentation and rhetorical appeals (logical, emotional, and authoritative). However, their mobilization process creates opportunities and constraints for the interpretation and implementation of mandated curriculum. Findings show that school actors use state policy as a resource to make logical and authoritative claims in their attempts to clarify conflicts between new curriculum ideas and their implicit schemas.

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Issues related to policy have significantly shifted in recent decades, as increased accountability has become a prominent feature of curricular reforms. In 2011, 37 U.S. states rewarded school staff with financial incentives based on high or increased student performance, 36 states provided assistance to low-performing schools, and 32 states sanctioned school staff based on low-performing students (Quality Counts, 2013). High stakes policy exerts tremendous pressure on districts and schools to improve student performance through incentive systems (Hall & Ryan, 2011; Loeb & Strunk, 2007). These policies send powerful messages about the importance of some subject matters over others—circumscribing skill and knowledge requirements. As a result, district officials and school leaders often employ curricular reform initiatives as a means to raise students' performance in the subject matters targeted by such policies. Policy thus compels school actors to focus resources on curriculum and assessments, professional development, and data-driven decision making (Anagnostopoulos, & Rutledge, 2007; Honig & Hatch, 2004; Spillane et al., 2002; Weitz White & Rosenbaum, 2008).

Some studies have underscored how district pressure figures prominently in school leaders' priorities, even when schools are not threatened with closure (Anagnostopoulos, & Rutledge, 2007; Spillane et al., 2002; Weitz White & Rosenbaum, 2008). High stakes policy has led to a shift in principals' actions in schools. This takes many forms such as the reallocation of resources away from particular students and toward literacy and mathematics instruction. Other scholars have shown that state requirements for standardized testing exert a significant amount of pressure and influence over instruction and curriculum (Au, 2007; Chiang, 2009; Jacob, 2005; Rouse, Hannaway, Goldhaber, & Figlio, 2007). They demonstrated how school leaders and teachers respond strategically to meet state requirements quickly and efficiently. Some of the instructional strategies included increasing the number of pass-level students in special programs, more time teaching tests subjects, more time teaching low-performing students, more time spent using teacher-centered pedagogy, and more time spent teaching core subjects. Some schools ended all teaching activities in science and history to spend more time teaching literacy and mathematics and to teach to test-specific items. These studies suggest that school leaders and teachers respond strategically to state and district policies and develop tactical means to raise student scores quickly

and avoid probation at all costs—sometimes at the expense of the quality of instruction and quality of experience for both students and teachers. Findings suggest two important foci for further research: (a) how local contexts influence school leaders' and teachers' instructional focus, and (b) how different actors influence and persuade teachers to focus on specific instructional efforts while ignoring others (Coburn & Woulfin, 2012). We know little about how high stakes pressures operate in day-to-day interaction and decision making within schools and how these lead to school leaders' and teachers' strategic responses. These studies indicate that it is crucial to understand not simply how school leaders and teachers choose to respond to high stakes policies, but how they understand the policy messages about teaching practice (e.g., content, standards, etc.) in the first place—in other words, what they understand themselves to be responding to—and also the legitimacy of policy as detailed in Spillane and Anderson (2013).

In this article, we aim to better understand the social processes that shape school actors' strategic responses to high stakes policy, specifically in terms of the mandated curriculum and instruction. We use the particular case of a mathematics curriculum reform. Mathematics as a high stakes subject matter allows us to examine how leaders attempted to influence and persuade school actors to make instructional changes in their responses to high stakes tests. More specifically, we explore different situations where school leaders and teachers argued with district leaders and university partners over the statements they made to persuade them to implement a new mathematics curriculum so as to raise test scores in a low-performing school. We use rhetorical argumentation analysis to explore how school leaders mobilized different resources in their rhetorical appeals (i.e., logical, emotional, and authoritative appeals) that created different opportunities and constraints for them in the reinterpretation and implementation of curriculum and instruction. By analyzing the social processes of argumentation that shaped school leaders' and teachers' strategic responses, we show that (a) school leaders and teachers did not simply reject, resist, and/or conform to the reform curriculum, but struggled to understand what were the curriculum ideas involved for teaching and learning and what these entailed for their classroom practices. In so doing, they repeatedly made emotional appeals illustrating their more established moral and ethical responsibilities they felt toward their students and underscoring their struggles and conflicts between their implicit schemas of teaching mathematics and the implications of the new curriculum ideas. We also demonstrate that (b) school leaders and teachers mobilized policy as a resource that enabled them to make logical and authoritative arguments in their attempts to clarify conflicts between new curriculum ideas and their implicit schemas. In analyzing rhetorical argumentation, we make two major

contributions to the literature on high stakes policy and mandated curriculum. First, studying argumentation is key in understanding the ways in which school leaders and teachers react, assert their claims, and position themselves in relation to high stakes policy and mandated curriculum. It also sheds light on how participants advise, press, and/or persuade school leaders and teachers to focus their efforts on specific content and students. In addition, the rhetorical appeals that participants use to coax and convey different policy messages provide a window into how different topics are negotiated, debated, and/or refuted.

Theoretical Anchors: Rhetorical Argumentation, Schemas, and Resources

We begin by situating this study within the field of policy implementation and rhetorical analysis. A rhetorical analysis allows us to explore the social processes of argumentation that shape school leaders' and teachers' strategic responses to the implementation of mandated curriculum in regard to high stakes policy. We pay close attention to school leaders' and teachers' statements about the reformed curriculum and instruction. While proposing different ways to implement the reformed curriculum, participants provoke argumentation that lead to consensus, disagreement, and contestation between school leaders, teachers, and other participants (i.e., district leaders, university partners). A rhetorical analysis focuses on the use of argumentation as a means of communication that allows participants to underline what they want to say (Crusius & Channell, 2010). In this perspective, argumentation is understood as a series of statements (i.e., truthful, plausible or acceptable declarations) and their justificatory relationships (i.e., how they support or justify one another; Jacobs, 2006). Rhetorical appeals consist of the different strategies a participant uses to communicate a message to an intended audience (Heracleous & Barrett, 2001; Kock, 2008). We examine three types of rhetorical appeals: logical (logos), emotional (pathos), and authoritative (ethos) (Jacobs, 2006; Lowenhaupt, 2014; van Eemeren, Jackson, & Jacobs, 2011). Logical appeals designate how a participant uses proof, facts, and/or evidence to convince the intended audience of the rational and intellectual foundation of the statements. Emotional appeals describe the way a participant uses figurative language, stories, anecdotes, and positive or negative emotions to provoke a reaction from the intended audience (Kock, 2008). Authoritative appeals refer to authority figures, experts, and policies—including texts—to persuade the intended audience of the statements' authority and/or force, and of the speakers' qualifications (Jacobs, 2006; van Eemeren et al., 2011). The three types of appeals are not mutually exclusive

and may overlap during argumentation. The use of rhetorical appeals sets the tone of argumentation among participants.

Schemas and Resources

We frame rhetorical argumentation as one element of the general social structure. Framing rhetorical argumentation as part of the social structure enables us to identify local beliefs and repeated patterns of interactions that shape school leaders' and teachers' understanding of reformed curriculum and instruction. Attending to how school leaders and teachers use rhetorical argumentation as a means of communication allows us to explore their schemas about teaching mathematics and how they mobilized logical, emotional, and/or authoritative appeals to influence and persuade the intended audience of the importance of their arguments about the curriculum textbooks, standardized test scores, and so on. In so doing, we observe how school actors' schemas, which are sometimes implicit, along with their resources, structured their understanding and interaction with district leaders and university partners (Sewell, 1992).

Schemas refer to the principles of action that frame how individuals interpret the social world and inform the use and value attached to resources (Anagnostopoulos, & Rutledge, 2007; Sewell, 1992). For instance, how school leaders and teachers view their students may inform their decisions as to which instructional resources to use and which ones they value most to teach mathematics. In other words, these schemas encompass school leaders' and teachers' deep values, beliefs, and prior knowledge about teaching and learning mathematics, which, in turn, influence the manner in which they respond to their environment and structure their arguments for or against curriculum reform. In turn, these schemas both reflect and reveal elements of the social structure.

The resources that we are referring to include incentives, money, and texts, and can be seen as media that may hold the "transformative capacity" of being interpreted in varying ways depending on who is doing the interpreting. Thus, such resources can empower different participants who have different schemas in different ways (Cohen, Moffitt, & Goldin, 2007; Giddens, 1986; Sewell, 1992). For example, teachers' capacity to reinterpret and mobilize policy texts and decide which aspects are mandatory and which aspects are best left to their professional discretion. In other words, schemas influence how individuals interpret or use resources available to them in their environment. In return, the use of resources by different actors works to validate, reproduce, or challenge existing schemas (Anagnostopoulos & Rutledge, 2007; Sewell, 1992). The content of participants' arguments reveals their

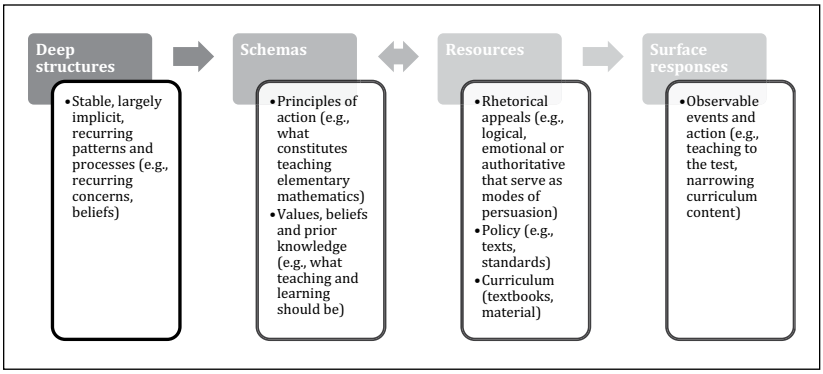

Figure 1. Exploring schemas and resources by rhetorical argumentation analysis.
Source. Heracleous and Barrett (2001) and Sewell (1992).

implicit schemas about teaching and learning mathematics. Through argumentation, participants' capacity to reinterpret and mobilize different types of resources (e.g., standards, tests, mathematical ideas, principles) can create opportunities for modifying existing schemas and shape participants' strategic responses to the implementation of reformed curriculum (Anagnostopoulos, & Rutledge, 2007; Giddens, 1986; Sewell, 1992; see Figure 1).

We chose rhetorical argumentation analysis because it allows us not only to shed light on how school leaders' and teachers' schemas influence their use of resources but also to observe how they are being persuaded to respond strategically to high stakes policy. In other words, even while school leaders and teachers mobilize resources through rhetorical appeals (logical, emotional, and authoritative) so as to argue *about* the reformed curriculum, their arguments are shaped by the way in which district leaders and university partners frame their statements. At the same time, even though formal authorities may use different resources through the use of rhetorical appeals to persuade school leaders and teachers, these latter may still question the relevance and/or validity of the statements. While analyzing school leaders' and teachers' arguments, we observe (a) *what school leaders and teachers say* about the new curriculum and instruction, which represents their understanding of teaching and learning mathematics (i.e., schemas); (b) *how school leaders and teachers* mobilize rhetorical appeals (e.g., logical, emotional, authoritative) to convey their message to the intended audience (i.e., purpose); and (c) *how district leaders' and university partners' arguments* create different opportunities and/or constraints for school leaders and teachers to implement curriculum and instruction.

Table 1. Professional Background of District Leaders, University Partners, and School Leaders.

Name	Position	Years of experience
Mrs. Jackson	District assistant superintendent for curriculum and improvement of instruction	24 years in the same district; previously a principal for 10 years, and a mathematic coordinator for 5 years
Mrs. Holmes	District math cadre teacher	25 years in teaching
Pam	University professor: Specialist in teaching and learning mathematics	3 years in position; previously 2 years in teaching high school science and mathematics
Susan	Postdoctoral student: Specialist in teaching and learning mathematics	2 years in position; previously 6 years in teaching elementary school
Mr. Curtis	Principal	3 years in position; previously 15 years in administrative positions
Marcia	Second-grade team leader	23 years in teaching and 13 years in teaching at Wayne Elementary
Donna	Third-grade team leader	22 years in teaching

Note. The school and all participants' names are pseudonyms.

Method

This article is based on a secondary analysis of a data set gathered as part of a larger 4-year longitudinal study that was carried out in eight elementary schools from 1999 to 2003 (The Distributed Leadership Study, http://www.distributedleadership.org). There are two reasons why we focus on one low-performing school, Wayne Elementary School. First, at the onset of the study in 1999, a curricular reform initiative was under way in mathematics in the district. Second, multiple external interventions were conducted at the school in the second and third grades, and on-site university partners were present once a week over the entire study period. Therefore, the case study of Wayne Elementary School offers rich data on one high stakes subject matter, that is, mathematics, and allowed us to explore school actors' initial responses at the beginning of the implementation process.

The use of multiple methods (triangulation) allows for an in-depth understanding of ongoing social processes that take place between school leaders, teachers, and other leaders (e.g., district leaders, community members, and university partners). Data gathering included interviews and observations of different meetings conducted over a 2-year period (2000-2002). Ten semistructured interviews of leaders involved in the curricular reform at the second- and third-grade levels were used for this article (see Table 1). The term "leaders"

designates those individuals who hold formal leadership positions (e.g., district curriculum specialists, grade team leaders). Interviews served to gain a better understanding of school leaders' arguments about teaching and learning. All interviews were audiotaped and later transcribed. In addition, most of the formal meetings and staff development activities that occurred during the study period were either audio or videotaped and transcribed. Field notes gathered by Amy Coldren (2006) contain detailed narratives of the interactions occurring during meetings at Wayne Elementary School. Observations, documented at three meeting situations (e.g., faculty meetings, workshops, and district assistance sessions), aim to reflect the ongoing argumentation among school leaders, teachers, and other actors. In total, 18 observations, in which school leaders, teachers, district leaders, and university partners discussed the new mathematics curriculum, were selected. The analysis of this data set enabled us to draw conclusions about how school leaders and teachers understand the statements and the modes of persuasion that may lead them to adopt strategic responses.

Data Analysis

First, we read all the transcripts—observations and interviews—and selected those where school actors and other participants argued about mathematics. Second, using QDA Miner, a software program, we closed coded (Van der Maren, 1996) any references to mathematics across the data set. The coding scheme included two broad categories—"schemas about mathematics" and "resources"—to explore the different topics of argumentation that occurred between school leaders and other participants. Within the two main categories, we had three subcategories based on the rhetorical appeals used by various participants during argumentation: logical, emotional, and authoritative. Third, we selected and coded segments where participants talked about the two broad categories throughout the data set: mathematics (i.e., "materials," "content," and "activities") and resources (i.e., "standards," "assessments," "benchmarks," and "standardized tests."), and classified them based on the rhetorical appeals used (i.e., logical, emotional, and/or authoritative). We double-coded any segments that referred to both categories to identify the topic of argumentation that concerned both elements. Through this initial process, we worked to identify "how much is packed into small bits of data" to gain an understanding of the underlying social processes that shape school actors' strategic responses to high stakes policy, specifically in terms of instruction and reformed curriculum (Strauss & Corbin, 1998, p. 65). In total, 63 segments were coded. To reduce any potential bias, 5 segments, all monological arguments, were excluded (e.g., the declaration of only one participant)

because it was not possible to explore other actors' rhetorical responses to these arguments. The number of segments that focused only on the same two actors was also limited, to include arguments from as many actors as possible in the analysis. In total, 55 segments were included in the analysis. Table 2 summarizes the coding scheme.

This coding scheme served to explore what types of rhetorical appeals were used by school leaders and teachers to negotiate, persuade, and/or convince the intended audience of a given statement used. Finally, we examined the content of these arguments (i.e., mathematic content, standards, and tests) within three situations: faculty meetings, mathematics workshops, and district assistance sessions. In so doing, we looked at how all participants used rhetorical appeals to argue different topics and on what grounds. Situations were compared to observe how discussions were settled and which ones remained open for debate (for further details, see the appendix).

District

The district is located in an economically diverse community in the suburbs of Chicago, and serves K-8 schools and more than 7,000 students. Three universities located in the area function as a support system for the schools, many of which have been named among the top performing schools in the State. The district office centralizes most decisions concerning curriculum, textbooks, and materials. In 1998, the district adopted and mandated the implementation of the first edition of a controversial mathematics curriculum, which was aligned with the National Council of Teachers of Mathematics (NCTM) standards (Coldren, 2006). The new curriculum de-emphasized traditional computation and skill-based content in favor of an inquiry-based approach focused on conceptual understanding and mathematical problem solving. The curriculum thus changed fundamental notions of mathematics teaching and learning and replaced a well-defined and structured sequence of mathematics content coverage with an alternative that emphasized a spiraling sequence. A spiraling logic requires a daily change of topics, over a 2-year period, albeit in increasingly complex ways. This new approach departed from traditional mathematics instruction where acquiring and mastering prerequisite skills and knowledge were deemed necessary to progress to subsequent content. The new program also included instructional changes, such as the use of symbols and numerical representations to solve mathematical problems, and questioning techniques used to guide students in explaining their reasoning.

Table 2. Analysis of Rhetorical Argumentation and Their Appeals (Coding Scheme).

Codes	Definitions	Indicators	Examples
Logic (logos)	A participant evokes an argument based on logic, proof, and/or rationality	Stating factual knowledge, evidence, or data as a reason to accept or refute an argument	Marcia: "Using manipulatives has proven to be more effective for low-performing students in mathematics" Connie: "State standards are significant indicators of students' progress."
Emotion (pathos)	A participant evokes his emotions to provoke a reaction from their audience	Evoking figurative language, stories, anecdotes, declaring positive or negative emotions to provoke a reaction	Marc: "I'm worried that my kids won't succeed on the test."
Authority (ethos)	A participant makes claim to the authority or credibility of a resource or an individual to persuade the audience of the validity of their arguments	Referring to authority figures, experts, policy texts, and high stakes accountability resources (state standardized tests, standards)	Paul: "The superintendent says that we must follow the district policy."

Wayne Elementary School

Wayne is a K-5 elementary school that served approximately 400 students in a small city outside of Chicago. 55% of students were characterized as low income and were eligible for the Free and Reduced Lunch program (Coldren, 2006). The student population was composed of Caucasians (29%), African Americans (58%), and Asians and Hispanics (12%). At the time of the study, the school was experiencing at least two major issues: (a) the gap in academic achievement, more specifically African American students who scored below White students, and to some degree Asian, Hispanic, and Native American students; and (b) a high mobility rate due to changes in the area (i.e., gentrification). The school was not identified "In Need of School Improvement" according to the Adequate Yearly Progress (AYP) specifications under the provisions of the No Child Left Behind Act. However, it was on the Academic Watch List at the time of the study. School improvement initiatives were, thus, instigated by both the district and school leaders to raise academic achievement and avoid probation. This made Wayne Elementary School an ideal site for exploring the ongoing processes of argumentation that shaped school leaders' and teachers' strategic responses to the implementation of the mandated curriculum.

Findings: Struggling With Reformed Mathematics

We contend that school leaders' and teachers' arguments exhibited how they did not simply reject, resist, and/or conform to the reform curriculum but also how they struggled to understand what were the curriculum ideas involved for teaching and learning and what these entailed for their classroom practice. School leaders and teachers relied on emotional appeals to underscore their struggles and the conflicts between their implicit schemas and the new curriculum ideas that they understood to be too advanced for the students. These implicit schemas involved school leaders' and teachers' deep values, beliefs, and prior knowledge about teaching and learning mathematics. For example, school leaders' and teachers' prior knowledge, beliefs, and experience emphasized first and foremost the acquisition and mastery of prerequisite knowledge and skills, whereas the new curriculum emphasized an inquiry-based approach, focusing on the development of critical thinking and investigation skills, and using symbols and numerical representations to solve mathematical problems. Understanding students' needs, as well as their school and home contexts, constituted an important part of teachers' and leaders' implicit schemas about teaching mathematics. The implicit and more established schemas of teaching and learning guided and influenced how school leaders

and teachers understood, negotiated, and argued about curriculum and instructional changes. In return, as school leaders and teachers voiced their concerns to the university partners and district leaders, they attempted to influence and persuade the intended audience of the relevance of their more established moral and ethical responsibilities, as well as the day-to-day practical issues of implementing the new curriculum with their specific student population.

School leaders and teachers struggled to figure out how to fit the conventional well-defined and structured sequence of mathematical topics into a spiraling sequence over a 2-year cycle. In this example, Marcia, the second-grade team leader, expressed her concern to Susan, the university partner. The topic of discussion focused on the acquisition of the traditional computational skills versus the new intent of gaining mathematical understanding of number concepts for students.

Marcia: I am having difficulty with the idea of teaching this "reform curriculum." My low-end kids need a lot of rote practice. The math games don't do it. There is a problem with the "home links" because with a lot of their kids, there is very little or no support at all from home. The reform curriculum fails these kids. They are not getting what they need from this program and me. My kids love computation . . .

Susan: In my experience, they may be able to do the problems rote [and get the right answer], but they don't understand it at all. They still see 465 [as numerals], no hundreds, tens, and ones at all.

Marcia: We do it [the reform curriculum], but it's frustrating at times.

In this discussion, Marcia began by expressing how she struggled with teaching the new curriculum. As she made her argument, Marcia appealed on the logical basis that low-end students needed a lot of rote problems, because they had little or no support from home. She posited that because the reformed curriculum did not provide rote problems, the curriculum failed these students. Marcia supported her claimed by explaining that by not doing the rote practices, she felt neither the curriculum nor herself provided students with the support they needed. Susan, the university partner, responded to Marcia's statement about rote problems (or computational knowledge). Appealing to her own experience as a way to give a stronger tone and credibility to her assertion, Susan tried to convince Marcia that the reformed curriculum enabled students to gain a better mathematical understanding. She justified her claim by stressing that while students were previously able to get the right

answer to a question using rote practices, they did not necessarily understand number concepts. However, in her assertion, Susan did not address Marcia's claims about how the reformed curriculum supported low-end students, given that rote problems were considered as a means to compensate for low-end students' lack of knowledge. Even though Marcia conceded that she was still implementing the reformed curriculum in her classroom, the fact that she invoked "it's frustrating at times" as an emotional appeal suggests that Marcia was still not entirely convinced about Susan's assertion.

School leaders and teachers also held strong beliefs that low-performing students needed to gain and master the prerequisite skills through repetitive activities. In this excerpt, Mr. Curtis, the principal, contended that

> . . . it [the mandated curriculum] assumes kids know things. We have quite a few kids who come with no math skills. And so then we throw them into the [reformed curriculum] program and the way the district wants us to do it.

Mr. Curtis assessed the appropriateness of the reformed curriculum based on his understanding of students' knowledge and skills, and pointed out the discrepancy between the two. He compared the level and needs of students with the latter, with the belief that the mathematical knowledge and skills required by the new curriculum were too advanced for them. He also underlined that complying with the district-mandated curriculum compelled teachers and leaders to progress through course material without students mastering skills or knowledge. School leaders and teachers asserted that the curriculum lacked basic prerequisite skills for low-performing students who did not possess the prior conceptual understanding, and that the pacing in which the material was covered was too fast. In this example, the topic of discussion focused on the assessment of the reformed mathematics:

Donna:	We want them [students] to do a good job, but the programs want you to move on.
Jane:	It [the reformed curriculum] spirals, but we don't give them time to learn or digest things.
Donna:	We set them up to fail.
Amy:	We all use the same language, at least in K through 5. We are all on the same page for this.

In this discussion, teachers addressed both the district leaders and the university partners to persuade them that the pace of the reformed curriculum set up students to fail. Donna, the third-grade team leader, invoked teachers' moral responsibilities as an ethical appeal to emphasize how they

want students to succeed, but nevertheless she believed that the program was too fast. This belief was intrinsically linked to her and her colleagues' schema of teaching mathematics. Jane reinforced Donna's statement by underscoring the fact that the spiraling pace did not provide enough time for students to master the prerequisite skills and knowledge. Following her colleagues' statements, Amy insisted on the fact that teachers worked collectively to use the same mathematical language. She posited that they were not simply rejecting the new curriculum but were struggling with the pacing.

School leaders and teachers also frequently invoked their "concerns" as an emotional appeal to highlight how implementing the curriculum's new content and activities involved a significant increase of instructional time for mathematics. In their arguments, school actors emphasized both their genuine efforts to understand and implement curriculum ideas into their daily instruction, and the challenges of fitting the new requirements of the mandated curriculum in the limited time allotted to mathematics during the school day. In what follows, Marcia, the second-grade team leader, brought up time management issues:

Marcia:	This would take 45 minutes—having them talk about one journal page. Am I correct in assuming you could spend 45 minutes on modeling this?
Pam:	You don't necessarily do it every day. This type of skill, or questioning, really cuts across subjects. It is not limited to math.
Marcia:	Should I allot once a week for this type of activity or do it more often?
Susan:	I'd say every day!
Mrs. Jackson:	Say one kid starts at the number 21. Ask him why? Why did he pick 21?
Marcia:	I'm very concerned with time and I'm aware that we have a finite amount of time to work with each day. How much time do I spend on this as opposed to the math journal sheet? You can only do so much . . . What do you give up? There is so much to do for the curriculum that we have to start making choices. In the long run will it help with the standardized tests or should we do computation? There are so many different messages! The bottom line is the superintendent [cares about] how they do on the Stanford Achievement Test. Do we work toward that or work on the child as a whole?

Pam:	The reform curriculum will help your students in the long run.
Susan:	You shouldn't see us this year as telling you what to do.This year is a discourse year. It is for you to try out. You are the judge of what works in the classroom.

In this excerpt, Marcia attempted to understand how much time she should spend on the new instructional activity. In their responses, three different leaders conveyed different messages about the use and time allotted for the specific instructional activity. First, Susan stated the fact that questioning techniques were transversal skills. Meanwhile, Pam provided a practical answer stating that they could perform the instructional technique daily. Mrs. Jackson, the district assistant superintendent, also answered with a practical example of how to perform the activity with students. Moreover, the two university partners contradicted each other in their advice about the frequency of the activity "not necessarily every day" versus "yes, every day." However, none of these arguments seemed to provide a satisfying answer to Marcia, who invoked "concerns" as an emotional appeal to stress the urgency of obtaining a straight answer about time management. Marcia underscored the fact that she has "a finite amount of time to work with each day" and is forced to prioritize instructional activities. She also raised another major issue pointing out that they received "so many different messages." She highlighted the inconsistencies of the logics between the reformed curriculum and test scores. Marcia argued that these inconsistencies rested on the new curriculum, which focuses on the long-term development of the child and the expectations of the superintendent to demonstrate quick results on standardized tests. By highlighting these inconsistencies, Marcia attempted to figure out what teachers should focus on or prioritize, and how to readapt their schedule based on their perceived increase in activities. She also attempted to persuade both the university partners and the district leaders of the importance of clarifying the time management issue.

School leaders and teachers engaged with the new mathematics curriculum attempted to figure out how to enact it in their classrooms and how to make sense of the conflicts between these enactments and their beliefs about teaching mathematics to low-performing students. Specifically, their schemas for instruction—in particular, their belief that low-performing kids needed basic skills to master conceptual understanding and so mathematics skills need to be sequenced from more basic to more complex—came into conflict with their understanding of core ideas in the new curriculum. This included an inquiry-based approach, a focus on the development of critical thinking and investigation skills, and the use of symbols and numerical

representations to solve mathematical problems. Teachers did not simply reject the reformed curriculum, but instead, in their struggles to implement the ideas they understood from the curriculum about teaching mathematics, they uncovered and voiced key conflicts regarding their beliefs about the best way teaching of mathematics for their particular student population. In voicing these conflicts, school leaders invoked both ethical and emotional appeals to influence the district leader and university partners to provide clear answers about day-to-day instructional issues, such as what to focus on or prioritize, and how to readapt their schedule based on their perceived increase of activities. School leaders and teachers also attempted to persuade them that they struggled with some of the conceptual ideas, such as pacing, lack of basic knowledge, and computational skills.

Validating Understanding and Clarifying Confusion Using State Tests and Standards

In their genuine efforts to implement the new curriculum, school leaders and teachers appealed to tests and standards to clarify the conflicts provoked between their schemas for teaching and their understandings of what the new curriculum ideas embodied. They used policy as a resource that enabled them to make logical and authoritative claims about their struggling attempts to implement new curriculum ideas. In so doing, school leaders and teachers worked to persuade district leaders and university partners of the confusion brought about by the conflict between new curriculum ideas and state district tests and standards. In these persuasion efforts, school leaders and teachers evoked the state standardized test (a) to question and clarify confusions about the content of the district's assessment, (b) to highlight the contradictions between the reformed mathematics curriculum and the state's requirements, and (c) to point out the contradictions between the different tests, namely, the state test and the district test.

School leaders and teachers evoked the district test to question the content and clear up the confusion surrounding assessing reasoning skills in mathematics. In this following excerpt, they talked about how providing explanations became a big issue in raising students' achievement when they were assessed by the district:

Judy:	That [an explanation] is a big part of assessments.
Erin:	They [the district] want to know why.
Marcia:	They want a picture and want you to explain how they did it.

Susan:	The problem might not be an understanding of math, but that language skills are a problem.
Judy [referring to a student]:	If that were an assessment, he'd get a 50% on it for having no explanation, even though he solved the problem.
Kate:	It's hard to put that stuff [an explanation] on paper. It's hard to make the transition from numbers to how to write it. Many nod in agreement.
Erin:	Some of my students have written explanations like "I used my brain."
Susan:	These things don't just happen [overnight]. Our goal should be movement on these things across time.

In this discussion, teachers underscored how explanations had become a significant portion of students' scores on the district assessment. Susan, the university partner, explained how providing explanations could be a language skills problem rather than one of understanding mathematics. Judy underlined the fact that explanations counted for 50% of problem solving, which caused some students to fail even if they did solve the problem. However, she did not provide an explanation. Kate also believed that the district requirement to provide an explanation was a difficult "transition from number to writing" for students. Erin supported her colleagues' claim by providing an example of how some students struggled to explain how they solve a math problem. Susan agreed with the teachers' logical claims by emphasizing that developing reasoning skills would take time.

Furthermore, school leaders and teachers appealed to the state standardized test to highlight that there was still confusion as to what they should be focusing on—computational or reasoning skills—so as to align with the tests. Consider an excerpt from a meeting in which university partners attempted to show teachers how they could help students achieve the new standard:

Susan:	What can you do to get students to be able to explain their answers?
Erin:	I ask things like, "how did you know to do that?" and "How would you explain what you did?"
Judy:	I don't think it [written explanations] should be on the district assessment. Others agree.

Susan:	I would start with something really easy, something they can do.
Pam:	What about modeling for the students? You could write the explanation on the board for the class. Does it have to be in complete sentences or something?
Marcia [reads aloud from the district policy text]:	Explanations must be clear and complete.
Emma:	There is the standardized test which tests a lot of computation and then there is the district test that is aligned with what we're teaching.
Eileen:	For the third grade, the ISAT [state standardized test] has those kinds of problems [written explanations].

In this excerpt, Judy called into question the validity of written explanation as part of a mathematical assessment. Susan and Pam, the university partners, did not directly address the issue. Instead, they refocused the conversation on what teachers could do to help students write down the explanations and, therefore, meet the requirements of the new curriculum. Susan inquired about the district's expectations by asking teachers whether students had to write complete sentences. Marcia referred directly to the district policy text as a way to provide a clear answer regarding the district's expectations. Eileen concluded by invoking the logic of the two tests to underscore the confusion surrounding district and state standards, as well as teachers' understanding that the mandated curriculum responded to the former, but not to the latter.

School leaders argued that although the new curriculum aligned with the district assessment requirements, they did not believe that it met those of the state standardized test because of its limited attention to computational skills. In the following excerpt, Marcia asked the district assistant superintendent, Mrs. Jackson, to provide them with a clear answer:

Marcia:	We consider Mrs. Jackson our expert for [reformed] math! The Stanford is a computational test. We are wondering what we are accountable for if it's not aligned with what we are doing.
Mrs. Jackson:	The ISAT is aligned. I would not worry about the Stanford. The overriding issue is the ISAT. I attended a meeting with the superintendents today and that was made clear today [at that meeting].

Marcia relied on facts about the content of the tests to illustrate the inconsistencies between the tests and the reformed curriculum, and she asked for clarity regarding what teachers were accountable for if student evaluations (i.e., the Stanford test) were not aligned with what was covered in class. Mrs. Jackson stated that the state standardized test (i.e., the Illinois Standard Achievement Test (ISAT)) was the most important test, but she did not address the issue of the inconsistencies between the different standardized tests. Invoking the authority of the superintendent enabled her to back up this statement and to deflect attention away from the issue of discrepancies between the two tests.

Negotiation, Persuasion, and Authority

Even though school leaders and teachers used the argument about state standardized test to persuade district leaders that the district tests and policy texts were not aligned, the same district leaders still tried to persuade teachers to follow the districts tests and texts. District leaders, along with Principal Curtis, did not directly advocate the merits of the district tests and texts as an acceptable measure of student progress. Rather, by relying on the mandated curriculum as a logical appeal, district leaders and the principal attempted to persuade teachers to comply with the new curriculum's educational philosophy and instructional changes. They justified their appeals by explaining that the district's choice of curriculum aimed to raise academic standards for students. They also drew on the state standardized test as a perceived authoritative measure of students' progress by teachers to support their claims about the benefits of new curriculum ideas. In so doing, district leaders and university partners set boundaries about the topics that could be negotiated, debated, and/or ignored in the implementation process of the mandated curriculum through their own mobilization of different resources (state and district tests). In so doing, district leaders and university partners established two areas of argumentation—negotiable and nonnegotiable—pressing teachers to comply with the nonnegotiable topics (e.g., the sequence and pace of curriculum, the state standardized test) and leaving some room for negotiable topics (pedagogical methods, scope of curriculum). We examined and compared these areas of argumentation, which occurred in three situations: faculty meetings, mathematics workshops, and district assistance sessions.

Faculty meetings. During faculty meetings, school leaders were explicit about the nonnegotiable aspects of standards, tests, and the new curriculum. School leaders worked to persuade teachers to modify their behaviors to comply with the district policy, tests, and standards. During the first year of the study, they

used reported speech by referring to their discussions with the district leaders, and used the mathematical language associated with the reformed curriculum to explain and press teachers to raise academic standards.

Mr. Curtis: I had a meeting yesterday with District Assistant Superintendent and District Literacy Director. They said that the one thing that is happening at the middle school, is what is being offered . . . what is being expected, is being raised. This raising of expectations trickles down to the elementary schools. Now, eighth graders are expected to take Algebra which means that they need to be prepared to take Algebra in the earlier grades. This means it is necessary to look at what fifth graders need going into sixth grade. When kids graduate from the eighth grade, it is expected kids will go into geometry, not algebra. Algebra will be the eighth-grade core curriculum. This trickles down all the way to the kindergarten teachers. With the fifth-grade team, we're talking about sixth-grade work . . . for the fourth-grade team, we're talking about fifth-grade work. In the math program, we must use mathematical language. When you use the little yellow cubes, you shouldn't refer to them as "cheese boxes" rather you should refer to them as their real name.

Eileen: Yellow hexagons.

Mr. Curtis: That is not the language used on [district] tests. It is important to use mathematical language. Don't short change the kids . . . use the language.

In the following discussion, Mr. Curtis referred to his meeting with the district leaders as a way to underscore what the district said and expected. In so doing, he worked to persuade teachers that using mathematical language and raising standards was part of the district's directives. He stressed that using the language of the reformed curriculum prepares students for the tests without specifying which tests: state or district. Mr. Curtis used the figurative appeal of "don't short change the kids" to appeal to teachers' moral duty toward their students as a way to reinforce the importance of his message.

During the second year of the study, school leaders used formal authority by referencing district policy to get teachers to comply with the pace and sequence stated in the district-mandated curriculum. They stressed that teachers' level of performance was now explicitly tied to some pedagogical aspects (e.g., using questioning techniques, engaging students in learning), as well as

content (e.g., sequence and pace) related to the educational philosophy of the curriculum. In this example, Mr. Curtis distributed a handout containing the components of professional practice to see whether teachers met the district standards. Mr. Curtis stated,

> The reason you got this is so you can be reflective. With respect to teaching, are you really doing what you should be? A good example is the "math thing." This is the first time everybody's teaching the same math series. Some people are being very proficient and some people are being really basic. You should follow the curriculum and stay with the sequence and pacing, if kids don't get it. Next year, you should bring everything together and master the basic so you can enhance and improve. You have to find different ways of meeting the needs of the students. You have to use your knowledge and skills. This is so you have an example [referring to the "level of performance" handout]. If you wonder what do you mean? You can go back to this. Keep this with you. This is where my brain clicks in. When I am observing I may think, "she's just doing some basic stuff right now" and "that stuff kind of stays with me."

In the second year, Mr. Curtis compelled teachers to enact and comply with the sequence and pace of the curriculum. He insisted that teachers should conform even if they were struggling with some aspects of the curriculum. He raised the stakes by emphasizing how classroom observations would take into account their compliance.

Focusing on "non-negotiables" with respect to implementing the reform curriculum, school leaders relied exclusively on formal authority to set the nonnegotiable nature of district standards and the mandated curriculum, including its sequence and pace, thus ignoring the notion that curriculum ideas could be negotiated. They provided little opportunity for teachers to modify their schemas about teaching mathematics through open conversations, negotiations, or debates. Considering that school leaders shared teachers' implicit schemas about mathematics, they explicitly structured their argumentation around the district directives through reported speech and policy references. In so doing, references to formal authority enabled school leaders to guide teachers in the specific and explicit direction required by the district without having to address their own struggle with some of the new curriculum ideas.

Mathematics workshops. During the first year of the study, the district partnered with a local university, holding a series of workshops designed to support teachers in changing their schemas and pedagogical methods in mathematics. The workshops were designed to develop teachers' critical reasoning and engage them in analytical observation and discussions about

teaching mathematics. Dialogues covered pedagogical topics related to reformed mathematics, such as the role of students' schemas in teaching and learning mathematics, student participation in classroom discussions, the use of vignettes, and other instructional methods in problem solving.

Susan and Pam, the two university partners, worked to convince school leaders and teachers of the relevance of the new mathematical paradigm (ideas, concepts, representations) for their students. They used logic by referring to principles of questioning techniques in the classroom to show teachers how to engage students in mathematical discourse, and to the multiple learning paths available to students for solving problems. University partners confronted teachers with the same type of exercises being asked of students. In this sequence, Susan, the university partner, initiated the conversation about how to teach fractions:

Susan:	Can someone explain how they solved the problem?
Mary:	We figured out we need four buttons for six paper clips, but I admit I didn't realize this until I got a hint from Susan.
Susan:	So you still do it numerically . . . You used numbers.
Marcia:	I would have gotten it wrong . . . I read the problem wrong and would have answered three instead of nine. I would have read the problem cursorily, quickly solved it, and given a solution that was not what was being asked for.
Susan:	In reform mathematics, you have to work with the kids on not rushing. The idea is to think about the problems a little more. Did someone solve it differently?
Erin:	I used pictures to solve it. I drew in the four buttons to correspond with the six paper clips and then added two more buttons (one above the four and one below) and the three more paper clips [one and a half above and one and a half below.]
Pam:	You drew a button and two paper clips, but only counted one and a half. Why was that?
Erin:	I don't know . . . I'm not sure.
Pam:	I thought that was interesting.
Marcia:	Why did you draw a button at the bottom?
Erin:	I had run out of room at the top.
Susan:	It's important to get your kids to ask questions about what they don't understand.

In this example, Susan and Pam modeled how teachers could use questioning techniques in their classroom to show and convince them of the benefits of this pedagogical approach for their students.

University partners also used their own experiences as elementary school teachers to give more authority to their statements concerning the feasibility of implementing the new curriculum ideas into classroom practices. They stressed how they themselves used these instructional methods with students, and how students benefited from it. In this example, university partners showed teachers how to teach subtraction from the reformed curriculum perspective:

Marcia:	I am inclined to represent both numbers to solve the subtraction problem rather than just the one. I would put 465. I would put 276. Some of my kids, they would have to see that.
Susan:	In my experience with mostly older elementary kids, they get confused when you have both numbers out there.
Marcia:	These are second graders. They need to see that block and that block.
Mrs. Jackson:	I would put 465 up there and 276 off to the side.
Marcia:	Right! Yes.
Pam:	Suppose you have the problem, I have 10 apples. Take away 3 apples. How many apples do you have left? Would you represent the 3 apples for them?
Susan:	If they [the students] need it, I would give it to them.

In this excerpt, Marcia struggled to understand the new way of solving subtraction. She stressed how some of her students needed to see the numbers as opposed to symbols. Three different people provided different statements. Susan relied on her experience as a teacher to emphasize how older elementary students get confused by the traditional instructional approach. However, this statement did not resonate with Marcia, who works with younger children. Mrs. Jackson, the district assistant superintendent, agreed with Marcia about the method for teaching subtraction. Pam attempted to provide an explanation using symbols. Susan, finally, concluded and contradicted her original statement by stating that if students needed [the illustration of number signs], she would do it the traditional way. In so doing, university partners sometimes made ambiguous statements about enacting the traditional versus the reformed pedagogical approaches. These ambiguous statements not only showed that there were disagreement and confusion even among "experts" on the new curriculum but also made it more difficult to persuade teachers of the relevance of using visual representations versus numbers to teach subtraction for students.

Focusing on the "negotiables" with respect to implementing the reformed curriculum, university partners relied mostly on the curriculum resources to

make logical claims about the new mathematics paradigm. They also supported some claims by highlighting their credibility as experts to influence and persuade teachers of the relevance of their statements. They provided little opportunity for school leaders and teachers to understand or negotiate how the new curriculum ideas aligned with the state and districts test and standards. Considering that university partners rarely relied on policy texts and resources, they left some pending questions about issues of alignment, relevance, and validity in relation to high stakes policy (e.g., How new curriculum ideas met state standards?).

District math cadre assistance. During the second year of the study, the district increased the presence of mathematical assistance by requesting that the math cadre teacher meet periodically with teachers in the different schools. Dialogues covered topics related to curriculum content such as the units in the textbooks, usage of materials in classroom activities, and any instructional issues teachers encountered. The math cadre teacher, Mrs. Holmes, was explicit about the nonnegotiable aspects of the curriculum, as well as the state and district tests and standards. Mrs. Holmes worked to persuade teachers to comply with the nonnegotiable aspects of new curriculum ideas and instruction.

Mrs. Holmes used formal authority by referring to the state standardized test to persuade teachers that past beliefs about computational skills were erroneous. In this example, she explained to teachers how the curriculum content and the state standardized test were aligned:

> How important is this unit? This is like a sample ISAT. I went to a meeting and my task was to find out how many geometry things there were on the test. There were 13 questions on geometry, 5 on probability, and 6 on measurement. There is relatively little computation . . . These tests are not in any way 8 plus 7. Teachers are still insisting that they spend all of their time on basic computation. If teachers think it's this [all about computation], it's all over.

Mrs. Holmes referred to facts and statistics to convince teachers that the mastery of basic knowledge and skills was not necessary for learning mathematics. She also showed them a sample test as physical evidence to support her claim that any persisting beliefs about computational skills were erroneous. In another sequence, drawing on the national standards logic, the math cadre insisted once again on the importance of stepping away from teachers' schemas of computational skills based on the national standards logic.

Mrs. Holmes: This is really important. This came from the national standards. We realized that we were behind other countries and our students couldn't build X. Some of the districts at this meeting were "hodge-podging it." Those days are over. There are teachers "who want basics," but I've been doing this for 25 years and they [students] never knew their facts. If it bothers some people then they can do 10-minute drills on computation, but computation should be 30% instead of 80%.

Marilyn: I feel like I am rushing through everything. I feel they [students] haven't grasped things and I have some kids who understand what they are doing, but I'm concerned about the other kids in my class who don't know what they are doing.

Mrs. Holmes relied on both her 25 years of teaching experience and the national standards as authoritative resources to persuade teachers that basic knowledge, such as facts, was not sufficient to foster learning in mathematics. Even though Mrs. Holmes used different resources and rhetoric to persuade teachers that the mastery of computational skills was not an essential part of learning, Marilyn, a second-grade teacher, remained worried about how the program would be able to foster learning for all her students. She underscored her skepticism by emphasizing her frustration in regard to the program. She reiterated her belief that some students needed to gain and master concepts. She also stressed the point that the curriculum moved too quickly. The discussions ended with some shared understanding between the parties that teachers did gradually guide students in the learning process "step by step."

On one occasion, Mrs. Holmes agreed with some of the teachers' arguments about the reformed curriculum in regard to the significant increase in instructional time and activities. In the following discussion, Mrs. Holmes addressed the informal "gray area":

Mrs. Holmes: I think it's a lot to get through Unit 4.

Michelle: We're moving . . .

Marilyn: We're moving on through but I'm not real confident.

Mrs. Holmes: Don't quote me on any of this, but that you can "skip" some of the explorations. "A" is always the teaching lesson, so you always should do that [that is the part that is teacher directed], but you can let go of B and C right now. Your other option is to take a week and a half to get

> through this and move into Section 5. The only negative is when you come back from break you're in the middle of it, for evaluation purposes . . . It would have to be your call.

Mrs. Holmes provided teachers with an opportunity to adapt the curriculum in terms of scope by highlighting which units were essential and which ones could be ignored. Mrs. Holmes called upon teachers' professional expertise for evaluating and deciding how they should adapt the curriculum to their classrooms. She noted "don't quote me on any of this" to informally underscore how teachers could skip some lessons.

Focusing mostly on the "non-negotiables" with respect to implementing the reformed curriculum, Mrs. Holmes relied mostly on the logic of state tests, statistics, and standards to stress teachers' faulty way of thinking about the prerequisite skills and knowledge needed to master conceptual understanding. She provided little opportunity for school leaders and teachers to understand or negotiate how and why moving away from the traditional approach of mastering basic knowledge and computational skills toward an inquiry-based approach was beneficial for students. Considering that the math cadre teacher had an understanding of teachers' implicit schemas, she pressed them to comply with the new curriculum ideas by emphasizing the connections between the ideas and the state standards and tests. By establishing the link between the facts and evidence and new curriculum ideas, it enabled the math cadre teacher to build on teachers' beliefs, values, and knowledge and to convince them that their existing schemas about teaching mathematics failed students. However, she did not give them much room to negotiate or confront her authoritative claims.

Discussion

By attending to the social processes that shape teachers' strategic responses during the policy implementation process, we build on and extend prior work on school leaders' and teachers' responses to the literature on high stakes policy and mandated curriculum (Coburn, Touré, & Yamashita, 2009; Coburn & Woulfin, 2012; Spillane & Anderson, 2013). In so doing, we extend the existing literature in three ways. First, consistent with prior work (Au, 2007; Chiang, 2009; Jacob, 2005; Rouse et al., 2007), and even though school leaders' and teachers' arguments displayed strategic responses about instructional and curriculum reform efforts at one level (e.g., narrowing content, focusing on basic skills and knowledge), the

analysis of rhetorical argumentation shows that interpretation and negotiation about the implementation of mandated curriculum operate in deep structures, which guide and influence social processes that exhibit strategic responses. By looking at these deep structures, we find the implicit and taken-for-granted schemas of teaching elementary mathematics in school leaders' and teachers' recurrent arguments that reflect deep beliefs, values, prior knowledge, and experiences in teaching and learning mathematics. In return, school leaders' and teachers' schemas reflected the social structures (primarily patterns of interactions among themselves and with district leaders and university partners) which guided and influenced their arguments and strategic responses.

Findings suggest that school leaders' and teachers' strategic responses to high stakes policy and mandated curriculum—while exhibiting the reinforcement of some persistent beliefs, values, and prior knowledge about what constitutes effective pedagogical methods, is not at the expense of the quality of instruction and experiences for students—but rather involves other tactics and rhetorical strategies. By exploring the implicit and taken-for-granted schemas of elementary school leaders and teachers, we note that the implementation of the reformed curriculum represented substantial changes in the educational philosophy, beliefs, and values of teaching and learning mathematics—a shift from a behaviorist toward a cognitivist view of learning. The way in which the new educational philosophy viewed students, where students are engaged in more complex ideas and thinking, was at odds with the elementary school leaders' and teachers' implicit schemas. Whereby students learn best through a hierarchical and linear structure, starting from basic skills and building up to more complex concepts and higher order skills and thinking (Melville, Kajander, Kerr, & Holm, 2013; Spillane, 2002). For example, while school leaders and teachers repeatedly focused on basic knowledge and computational skills in their arguments, their positions did not only advocate to reduce content to its simplest form (McNeil, 2000). Rather, these arguments reflected a more established and taken-for-granted behaviorist view of learning mathematics. As such, focusing on basic knowledge and skills represented a commonly held schema about what low-performing students need: a strong mathematical foundation to counterweigh their lack of numerical knowledge and to provide a basis for more complex concepts (Spillane, 2002). Appealing to the state standardized tests and policy texts as rhetorical strategies became a tactic or strategic response to sustain their arguments in their attempts to influence and persuade district leaders and university partners of the importance of basic knowledge and skills for low-performing students.

Second, findings show that school leaders and teachers appealed to the logic of state and district tests and standards to persuade district leaders and university partners of the confusing and ambiguous statements they received about the mandated curriculum and the different tests and standards. For instance, they attempted to validate and clarify confusing statements, conveyed by district leaders and university partners, about how the new curriculum was aligned to state and district tests and standard. Although different leaders stated clearly and explicitly that state standards and standardized tests represented an authoritative measure of students' progress, they unintentionally conveyed ambiguous statements by not providing a clear explanation about how the new curriculum aligned with these standards. Using state and district tests and standards as logical arguments, thus, became another strategy to make their position stronger in their attempt to learn how to implement the new curriculum in relation to external policy demands.

School leaders and teachers also appealed to the logic of tests and standards to highlight the confusion between the state and district test requirements. For instance, though teachers invoked state and district tests to clarify some of the confusion about what they should be focusing on—computational or reasoning skills—to align with state and district tests, they did attempt to understand how assessing more complex skills was relevant if the state continued to assess basic skills. In so doing, they attempted to point out how the content of the district assessment appeared unrelated to the content of other assessments in mathematics. In appealing to the logic of tests and standards, school leaders and teachers confront and validate their existing schemas of teaching with the schemas of the mandated curriculum. Relying on tests and standards, thus, worked as part of the transformation and learning process for school leaders and teachers (Anagnostopoulos & Rutledge, 2007; Sewell, 1992). Findings show how school leaders' and teachers' arguments also worked to influence district leaders, and that this influence was not solely held by formal authorities, but was sometimes reciprocal. For instance, school leaders and teachers appealed to state policy to persuade district leaders who are "in between them," of the validity of some of their arguments. District leaders and university partners give in to teachers' arguments about the validity of their claims that represents a much more complex story than is told in the literature (Coburn & Woulfin, 2012).

Third, findings suggest that the ways district leaders and university partners drew on different rhetorical appeals created different opportunities and/or constraints for school leaders and teachers to negotiate, confront, and/or debate new curriculum ideas, tests, and standards. These

leaders set boundaries about the reformed curriculum by establishing the negotiable (pedagogical methods, scope of curriculum) and nonnegotiable (sequence and pace of curriculum, state standardized test) topics across the three situations. For instance, district and school leaders relied mostly on formal authority to set the nonnegotiable nature of district standards and the mandated curriculum, including its sequence and pace, leaving university partners with the task of negotiating new curriculum ideas or pedagogical methods. However, the focus on specific negotiable and nonnegotiable aspects of the curriculum's implementation by district, school leaders, and university partners left some topics unaddressed. For example, while school leaders advocated the specific and explicit direction required by the district, they ignored the issue of how and why moving away from the mastery of basic knowledge and computational skills was beneficial for students' learning. In so doing, we argue that unaddressed topics opened up space for school leaders and teachers to interpret, in their local settings, some aspects of curriculum content and pedagogical methods according to their existing schemas (e.g., what they believed would be best for their students; Coburn et al., 2009).

Findings also illustrate that while the dominant rhetorical appeal was to invoke the logic of policy texts and tests to persuade teachers to comply with the mandated curriculum, district leaders and university partners also relied on different resources and rhetorical appeals to convey strong statements (Lowenhaupt, Spillane, & Hallett, in press). Persuasion efforts to promote the new curriculum and instructional change to raise standards and improve student achievement depended on district leaders' and university partners' ability to mobilize a range of different resources (e.g., curriculum resources, policy texts, standards, and tests) and to adapt their rhetorical appeals to the context of the conversation (e.g., teaching experiences, teachers' moral sense of duty). For example, university partners' efforts to promote the new curriculum and instructional change to raise standards became onerous because they lacked the knowledge related to policy environment (e.g., policy texts, standards, and tests) to support their justification of the benefit of curriculum and instructional change for teachers and students. While invoking the logic of the new educational philosophy, university partners, who worked to convince teachers of the benefits of the new approach for students, saw some arguments weaken in the course of conversation because they were unable to answer specific questions about the alignment of new curriculum with tests and standards. In those instances, university partners endeavored to convince teachers of the relevance and validity of these new curriculum ideas in relation to high stakes testing demands (e.g., how new curriculum ideas met state standards).

Implications and Conclusion

These findings have three main implications for research on high stakes policy and implementation. First, this study underscores the role of emotional appeals (or pathos) as an important source of information about school actors' implicit and more established schemas of teaching and learning, or the manner in which they guide and shape responses to their environment and structure their arguments for or against curriculum reform. Even though we cannot generalize these findings, this suggests looking beyond the display of emotional appeals to examine the content of arguments or what is being said that may embody the deep values, beliefs, and prior knowledge. In this study, although school actors' emotional appeals have sometimes been invalidated with logical arguments, these findings showed how ignoring the former appeals made it difficult for leaders, not only to modify the implicit schemas but also to persuade school actors to make specific curriculum and instructional changes. Further investigations could examine the role of pathos in negotiating and persuading school actors' decisions and actions in relation to curriculum and instructional changes. More specifically, how and when the use of emotional appeals convey stronger arguments to school actors and may help to modify implicit schemas to implement curriculum and instructional changes over time.

Second, this study illustrates how the nature of the rhetorical appeals and resources used in leaders' arguments played an important role in attempting to influence and persuade teachers to implement expected curriculum and instructional changes. These findings illuminate how some rhetorical appeals can work better than others to negotiate and persuade school leaders and teachers to implement curriculum and instructional changes. One plausible explanation is that resources carried varying degrees of authority in the arguments to persuade school actors to implement the new curriculum. For example, high stakes state standardized tests and policy texts as resources for rhetorical appeals gave more credibility and authority to leaders in persuading school actors of the validity and coherence of new curriculum ideas and content with external demands. This suggests that leaders' ability to mobilize different resources comes from their knowledge of both curriculum and policy demands. This also resonates with the argument that both the educational and political roles of university partners should be considered in bringing about substantial changes to school leaders' and teachers' implicit schemas about teaching and learning mathematics (Coburn & Woulfin, 2012). Further investigations would benefit from examining how leaders' knowledge and mobilization of the different resources (e.g., standards, tests, and benchmarks)

and rhetorical appeals (e.g., pathos, logos, and ethos) may work to gradually influence and persuade school actors about the relevance, consistence, and validity of their proposed arguments over time.

Third, this study offers a useful analytical approach to examine the multiple interpretations and influences of leaders and their interactions with teachers in schools (Heracleous & Barrett, 2001; Lowenhaupt, 2014). By examining the rhetorical appeals and comparing the situations in which leaders used them, these findings showed how the negotiation and argumentation processes were shaped by mutual attempts to influence between district leaders, university partners, and school actors. These findings illustrated how district leaders and university partners rhetorically created areas in which school actors could or not negotiate the aspects of curriculum that were mandatory and those that were left to their professional discretion. In addition, school actors also attempted to influence and persuade district leaders and university partners that they had a struggle to understand and needed clear answers to the perceived contradictions between the reformed mathematics curriculum and the state's requirements, and between the state and district tests. Further investigations may consider how and why different system and nonsystem actors are able to create opportunities to negotiate and influence school actors to implement curriculum and instruction and to respond to high stakes policy. By attending to the role of different actors, researchers could also seek to better understand what makes some actors rhetorically more successful than others in helping and persuading school actors to implement expected changes.

Appendix

Comparison of the Rhetorical Appeals About the Mandated Curriculum Over a 2-Year Period (2000-2002).

Types of arguments	Faculty meetings (2000-2002)	Mathematics workshop with university partners (2000-2001)	District mathematics assistance with math cadre representative (2001-2002)
Logic (factual knowledge, evidence, or data)	**Strategies used by school leaders in relation to instructional practice:** **Referred directly to the district standards and components of professional practice text to ensure teachers complied with their instruction plan and curriculum pace and sequence** **Underscored the importance of using the mathematical language as a means of raising academic standards**	**Strategies used by university partners in relation to the new mathematical approach:** **Referred to students' representations to justify the necessity of conceptual changes in mathematics (shift toward visualization versus traditional numerical representation)** **Evoked lack of time to move on from ongoing debate about the relevance of the curriculum in regard to the state standards and standardized test**	**Strategies used by the math cadre representative to demonstrate the logical fallacies of focusing on basic knowledge and skills in mathematics:** **Relied on statistics and the number of questions on the** Illinois Standard Achievement Test (**ISAT**) **to show the low portion of computational skills assessed** **Used national standards and low-performance on international assessments to justify the relevance of implementing instructional changes**

(continued)

Appendix (continued)

Types of arguments	Faculty meetings (2000-2002)	Mathematics workshop with university partners (2000-2001)	District mathematics assistance with math cadre representative (2001-2002)
	Proposed supplemental place value material aligned with the NCTM standards; Asserted that material used same mathematical language to convince teachers of considering supplemental material **Used the fact of "being four points away from warning" to persuade teachers to work collectively for the betterment of the students; stressed the importance of instructional consistency between and across grades** **Insisted on accelerated standards as a source of alignment with high school standards**	Strategies used by the district superintendent in relation to curriculum: Referred to data to support her claim that the curriculum helped improve students' performance on computational skills Strategies used by the teachers in relation to the curriculum and testing demands:	Strategies used by school leaders in relation to inconsistencies in their school: Underscored the inconsistency of mathematical languages and concepts across grades supporting their claim by the fact that K-1 grades were piloting a different program than 2-6 grades

(continued)

Appendix (continued)

Types of arguments	Faculty meetings (2000-2002)	Mathematics workshop with university partners (2000-2001)	District mathematics assistance with math cadre representative (2001-2002)
		Evoke state and district tests to underscore the contradictions among the two and confusions it created in regard to the concepts and content coverage to prioritize Relied on the district assessments to underscore require students to write explanations for their solutions and the skills that are really being assessed	
Pathos (stories, figurative speech, and testimonies)	No coded sequence	**Strategies used by teacher leaders and teachers in relation to both the new mathematical approach and testing:**	Strategies used by the math cadre rep to underscore the misconceptions and the erroneous of past beliefs:

(continued)

Appendix (continued)

Types of arguments	Faculty meetings (2000-2002)	Mathematics workshop with university partners (2000-2001)	District mathematics assistance with math cadre representative (2001-2002)
		Evoke their worries to appeal to university partners . . . to question the relevance of curriculum content for low-performing students; underscored their difficulties on the district assessments on the writing explanation portion **Marked their difficulties to demonstrate the complexities of the conceptual and instructional changes in practice as well as the increased curricular activities and content coverage**	Use figurative speech such hodge-podging to connect teachers' with the idea that districts previously did not know exactly what they were doing

(continued)

Appendix (continued)

Types of arguments	Faculty meetings (2000-2002)	Mathematics workshop with university partners (2000-2001)	District mathematics assistance with math cadre representative (2001-2002)
Ethos (credibility, authority, and expertise)	Strategies used by school leaders in relation to accountability demands: Evoked district authority figures to ascend to the state standardized test over the district assessment, and the alignment between the curriculum and state and district tests Strategies used by teachers in relation to instruction program decision making: Debated about local versus district expertise as a way to gain teachers' commitment and mobilize them to change instruction	Strategies used by university partners to build confidence and their credibility about teaching the reform mathematics: Evoke her experience to reinforce arguments about the feasible and efficacy of instructional changes Strategies used by the district superintendent in relation to convince teachers Stated that the state tests should have priority over the district assessment; Supported her claims on the decision made during the superintendents' meeting	**Strategies used by math cadre rep in relation to the relevance of the curriculum:** Worked to persuade teachers' of the efficiency of certain curricular activities based on her own experience Referred to the ISAT to show the alignment of the curriculum with the states requirements

(continued)

Appendix (continued)

Types of arguments	Faculty meetings (2000-2002)	Mathematics workshop with university partners (2000-2001)	District mathematics assistance with math cadre representative (2001-2002)
		Strategies used by teachers both state policy: Evoked the superintendent's discourse to state that the district assessment was the bottom line Called upon the district superintendent to answer questions about standardized test requirements and to what teachers were accountable for	

Note. Most frequent arguments in bold: calculated based on word frequency on coded segments. NCTM = National Council of Teachers of Mathematics.

Authors' Note

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