Teacher Learning about Teacher-Parent Engagement: Shifting Narratives and a Proposed Trajectory

Corey Drake, Iowa State University, E115 Lagomarcino Hall, Ames, IA, 50011, cdrake@iastate.edu
Angela Calabrese Barton, Michigan State University, Erickson Hall, East Lansing, MI, 48824, acb@msu.edu

Abstract: In this paper, we examine teacher learning about teacher-parent engagement in mathematics and science education. Using data from three different schools participating in TE-PAC^2 (Teacher-Parent Collaborative Communities), we find evidence of teacher learning in the stories teachers tell about the meanings of – and possibilities for - teacher-parent engagement in the context of broader cultural narratives about the teaching and learning of mathematics and science in their schools and districts. In particular, teacher learning was reflected in *changes* in teacher narratives over time and in the new understandings of parent resources incorporated into these shifting narratives. We conclude with a proposed trajectory of teacher learning about teacher-parent engagement.

Introduction

National policies (e.g., No Child Left Behind) emphasize parental involvement in schooling, but little research has been done to establish *how* teachers might engage with parents in content-based instruction, particularly in ways that acknowledge the diversity of backgrounds and resources parents bring to the classroom. This is the issue we investigated through our work in three schools with teachers and parents engaging together in science and mathematics education. As part of this effort, our research questions included:

> How and what do teachers learn about teacher-parent engagement in support of mathematics and science instruction when engaged with parents in the collaborative study of science and mathematics education reform policies, documents, and curriculum materials? How is teacher learning reflected in teachers' narratives about parent engagement in their particular schools and districts?

We investigated this question through the design and implementation of a teacher-parent collaborative experience, TE-PAC^2 (Teacher-Parent Collaborative Communities). At each of the three schools, this experience took on a different structure and focus, but common elements included multiple sessions of teachers and parents (along with a researcher/facilitator) working together to discuss goals for mathematics and/or science education, investigate mathematics and/or science curriculum, and jointly planning classroom or school events that engaged parents, teachers, and children together in learning and teaching mathematics and/or science.

Theoretical Framing

In our own work, we, like others, have observed that while the rhetoric of reform—especially from multicultural perspectives—suggests that parents should be closely involved in the reform process, the reality is that parents and teachers alike struggle with how best to bring parents into reform-based instructional practices (Peressini, 1998; Remillard & Jackson, 2006). We believe that if teachers are to be successful in engaging parents in support of student learning, then it must happen within the framework of—not peripheral to—content-based instruction. In other words, teacher-parent engagement must occur not only in the context of helping with bus lines, lunch or recess duty, and field trips, but also around issues central to the teaching and learning of mathematics and science.

Our view of teacher learning is grounded in sociocultural perspectives on learning, where learning is framed as changing participation within communities of practice (Lave & Wenger, 1991). We concur with Peressini, Borko, Romagnano, Knuth and Willis (2004) that "teachers' knowledge and beliefs interact with historical, social and political contexts to create the situations in which learning to teach occurs" (p. 68). We assert that these interactions can be particularly powerful when parents are co-participants with teachers, especially when teachers and parents reflect different cultural and social backgrounds. This view of teacher learning re-situates how we think about teacher–parent engagement and how teachers learn by engaging parents. In contrast to traditional understandings of parent involvement, which include parents volunteering in a range of school-defined ways, we define engagement as an interactive process in which teachers and parents draw on multiple experiences and resources to define their interactions with one another. In prior research, we developed a model of parental engagement in urban elementary schools, specifically in relation to "what" parents engage in and "how" they do so

(Calabrese Barton et al., 2004). Parents' effectiveness in schools is related to where engagement in the curriculum occurs, as well as to the resources parents activate to support their children's schooling. This understanding of parental engagement differs from traditional models because it highlights the importance of space and capital as mediators of parental engagement and positions parents as authors and agents within schools. This last distinction is particularly important in low-income urban schools, where parents tend to feel more alienated and with little power (Harvard Family Research Project, 2002).

One area of capital exchange that has proven critical is the exchange of resources and understandings related to subject matter knowledge, pedagogy, and goals. Studies of learning in mathematics professional development indicate that teachers increased their communication skills and content understanding when engaged in content learning activities with parents (Civil & Quintos, 2002). Likewise, parents who participated in their children's elementary classrooms reported that talking about teaching, learning, and personal experiences, listening to different perspectives and opinions, and teaching mathematics to other parents were rewarding aspects of working in schools (e.g., Jackson & Remillard, 2005).

Lee and Bowen (2006) suggest that the link between parental involvement and increases in student achievement might be explained by the capital gained by parents through school involvement. However, little work has explored gains in *teachers*' capital that might also contribute to this link, especially when parental engagement is deeply situated in instructional content. It makes sense that we extend current research to include not just the nature of resources gained by parents but also those resources gained by teachers, and how the deployment of these resources frames their changing participation with parents. Thus, an integral part of our investigation is understanding teacher learning with respect to the resources that parents and families offer for a particular content area, the potential spaces within mathematics and science curricula and curriculum materials for accessing and building on these resources, and the relationship between these resources and school-based knowledge and practice.

Data Sources and Methods

Contexts

Our work has taken place across three distinct schools and districts, all of which are faced with intense pressures for testing in mathematics and literacy, and all of which have significant percentages of students living in poverty. The overall study took place over two years, though we spent one year in each school.

Palmer School is a fairly small school in Granite School District, with about 420 students, K-6. The school had recently taken in students from a neighboring school that closed due to lower enrollments and test scores. The principal of Palmer is highly active in recruiting novel programs to her school, such as linking her school with a fine arts center in the city, allowing the students and teachers multiple opportunities to integrate the arts across instruction. Palmer Elementary School is located in a mid-sized US city confronted with issues of changing demographics, limited resources, and testing mandates. The school district is an urban school system with approximately 20,000 students, of whom 78% are African American, 19% white and 3% Latino/a. 70% of the students are eligible to receive free lunch.

Washington Elementary, in the River City School District, is a mid-sized elementary school with three or four classrooms per grade (K-5) and approximately 550 students total. Washington Elementary was created through the merger of two schools two years prior to this study and is housed in a modern building built at that time. The building also houses a large Boys' and Girls' Club as well as a thrift store. The two schools that were merged to create Washington School were among the district's lowest achieving in terms of standardized test scores. Part of the Washington's vision is to engage parents, families, and the community in their children's education. To support this vision, Washington Elementary has a dedicated space in the school for parents and also offers several adult education opportunities. However, there is little parent involvement in classrooms or in the content of children's schooling. The student population at Washington is racially and ethnically diverse, with significant numbers of African-American, Latino/a, and Asian students, as well as students from a variety of European and African countries.

Beacon Academy is a free k-8 public charter school in Middleton. It sits on the west side of town, on the edge of two transitional neighborhoods. The school focuses overtly in its mission statement on "character" and "special" education, marketing itself to families whose children have not fared well in the regular school district. While the city of Middleton serves as home to 22% African American, 10% Hispanic, 3% Native American, and the remaining 64% White, Asian, or Pacific Islander and 23.2% children in poverty, Beacon Academy serves >95% African American or Hispanic students, and 100% in poverty. The school promotes itself on brochures and its website as a high quality school that teaches all core subjects and also offers "instruction in computers and technology, art, music, drama and Spanish.". However, due to low test scores, the school administration mandated in mid-April that no science or social studies be taught, causing some tension with our own project. Finally, Beacon

Academy's administrative staff is proud of its level of parental involvement. They hold an annual parental involvement celebration day, and the very first bulletin board one sees upon entering the school is one that welcomes parents and contains information and notices to help them navigate the school. Parents are employed on the staff to work in the office and to help out in the lunchroom. However, most parents have not been involved in the academic side of the school.

Data Generation

We have utilized a narrative-driven ethnographic approach to investigating how learning with and about curricular materials, reform-driven documents, and academic content in collaboration with parents impacts the ways in which teachers engage parents in the design and enactment of school-based instructional practices. We utilized a range of primary methods in crafting our case studies (See Table 1).

Table 1: Overview of data generation strategies across sites

	Palmer	**Washington**	**Beacon**
Teacher Interviews	3 teachers, each interviewed twice (student artifact think aloud, interview on T-P engagement)	5 teachers interviewed twice (beginning and end of experience), 1 interviewed once (end of TE-PAC^2 experience)	4 teachers interviewed once (end of experience)
Parent Interviews	4 parents, each interviewed once on T-P engagement	2 parents, each interviewed once (Several other parents participated in TE-PAC^2 activities, but were not interviewed)	2 parents interviewed once (end of experience)
TE-PAC^2 sessions	Audio and fieldnotes	Fieldnotes	Fieldnotes
Classroom observations	3 teachers, science classrooms observed 6 times each, 30-60 minutes per observation, fieldnotes	Observations and field notes for Family Math Night	Observations and Fieldnotes for 7 science lessons (in science, computer, and ELA classrooms)
Teacher and Parent-related Artifact Collection	Lesson plans; home extension lessons; student life cycle stories	Planning sheets from TE-PAC^2 workshops, activities created for Family Night	Lesson plans Extension activities Pictures of materials for walls
Student Interviews and Artifacts	Student lifecycle stories Fieldnotes on student participation	Artifacts Fieldnotes related to student participation	6 student interviews Student storyboards Student movies Fieldnotes on student participation

Data Analysis

In analyzing and discussing these data, we utilized the Ecologies of Parental Engagement (EPE) framework we developed in a previous study (Calabrese Barton et al., 2004) and focused on the importance of space and capital. In particular, to make sense of teacher learning, we examined how participation within certain communities frames issue of space and capital. Given our work with parents in low-income urban schools, we were particularly concerned with how parents are often positioned within and against the communities of practices that make up urban schooling. This led us to a key analytic idea, which emerges from cultural-historical and hybridity theories - namely, that acts of creating hybrid spaces, discourses and identities are always political and of the highest risk for those whose knowledge, discourse, and identities are positioned as lesser. Individuals in any given community of practice engage in acts of hybridity all of the time when confronted with differences. They draw upon multiple resources or funds to make sense of the world. Yet, being "in-between" several different funds of knowledge and Discourses can be either productive or constraining, and even marginalizing, depending upon how they are recognized by those in power (Moje et al., 2004).

Case study data analysis involved multiple stages and levels of coding, all of which were based on Strauss & Corbin's (1998) procedures for open coding and method of constant comparison. In analyzing case study data, we have begun to develop coding schemes on those aspects of teaching which seem to be particularly relevant to teacher-parent engagement in urban settings, including the kinds of curricular spaces teachers create for parental engagement, the forms of capital teachers activate in support of engaging parents in content-based instruction, the roles/identities teachers take on in relation to parents, and the ways in which scientific and mathematical ways of thinking are linked to families' interests, experiences, and everyday understandings of the world (Perez Carreon, Drake, & Calabrese Barton, 2005).

In this paper, we focus in particular on the stories and counter-stories teachers tell about parent engagement in their schools. We claim that changes in these stories over time provide evidence of teacher learning related to teacher-parent engagement in mathematics and science content – including the goals, purposes, and practices that support this kind of content-related engagement. We define teacher stories, or narratives, as socially shared accounts of human intention and action (Bruner, 1990). For stories to have meaning in teaching and educational research, they must report more than a listing of dates, places and events. They must also speak to the meaning of those events in an individual's life. In the tradition developed and expanded by Clandinin and Connelly (2000) and others, we use teacher stories to develop rich, contextual, accounts of their learning. Drawing from place-based sociocultural theory, we argue that personal stories, such as teacher stories, always exist in interaction with narratives at other levels, including social and cultural (Tzou, Scalone & Bell, in press). As teachers, for example, interact with each other they do so in spaces that are shaped by cultural narratives and resources available in those places, such as a school climate deeply shaped by NCLB, curricular policies, and other boundaries and supports related to the teaching and learning of mathematics and science.

Findings

Our findings are grounded in teacher stories and teacher practices with respect to mathematics and science instruction and parent engagement. These stories consist of the narratives that teachers craft about their teaching alongside the artifacts from practice they use as evidence for their claims. We begin with cases from two of the participating schools. (Due to space limitations, we do not present a detailed case from the third school, Beacon Academy, here, though we incorporate findings from that case in the discussion section below.) These cases provide a sense of the kinds of activities involved in the TE-PAC^2 experience, as well as the supports and constraints available in the different school and district contexts for this kind of work. We then describe findings related to teacher narratives – and changes in those narratives – across the three sites.

Case 1: Palmer School

This group began meeting in February and involved three 3rd and 4th grade teachers who attended all six of our after school study group sessions, except one week when one of the teachers was absent due to a technology conference. The teachers were supported by their principal who would often stop in for a brief moment with a big smile and ask how everyone was going. They were also supported by the district curriculum coordinator for science who came to the fifth of our six sessions to ask the teachers and parents to discuss their work with her. Four parents attended fairly regularly, with one missing occasionally, and one additional parent showing up at science class because she could not make the after school sessions. One of the parents was a grandmother who had extensive parenting responsibilities for her grandchildren. Sometimes her granddaughters would come to our sessions but they mainly played with each other and tended to "ignore" what the adults were doing.

The structure of the meetings was to first to talk about "science experiences" of the week, then to "do science" together and then to discuss ways to increase parent-teacher engagement using two strategies that we proposed: Lesson Extension Ideas and Lesson Integration Ideas. Playing with science often involved taking one aspect of the mandated curriculum and doing the activities together, often in ways not prescribed in the text. The early work of the group tended to focus more on designing and implementing "extension lessons for the home" and then shifted to lessons that integrated activity in the home with activity in the classroom. The focus of these latter discussions sat within a tension of "what would parents know about science" and "what will kids do in the classroom who don't do the home component." These discussions tended to focus on the deficiencies of some of the parents within the school community, but the group decided to move forward with the belief that these activities might "bring parents in."

The major barrier that the participants seemed to face related to instructional mandates that involved science. The Granite City School District, like many around the nation, had been undergoing a series of reforms meant to help boost test scores. A recent reform initiated by the superintendent's office had been the discontinuation of any interdisciplinary teaching to ensure that each subject area was taught for the required amount of time each

day. All three participating teachers were vocally opposed to the new mandate and felt "harassed" by the district official who roamed the building making unannounced visits to "check up" on instruction. This topic came up each week as teachers met to explore life cycles together – and, through these discussions, teachers and parents were able to expand their knowledge related to one another's perspective and to the broader policy and instructional contexts of school science.

What seemed particularly salient was *how* discussions of these new mandates emerged within the group and the barriers these mandates imposed for teachers and parents in their efforts to support student science learning. In particular, we noted that the teachers, from our very first TE-PAC^2 session onward, spoke critically of the new regulations for scripted "page a day" curricula and on the emphasis on basic skills or what the teachers referred to as "kill and drill." We also noted that the teachers contrasted these mandates with their desire to use more "hands-on" and "inquiry-based" learning in support of student motivation to learn science and making science more authentic. As Beth reminded us, students need a reason to want to understand science. Parents were less critical of the new mandates primarily because they seemed to not be as aware of the specific mandates. However, in support of the teachers' desires to use more hands-on learning, the three parents harshly criticized the culture of accountability and test scores as making it more abstract and difficult for them to understand what their students were learning and how they might better support them in learning.

Case 2: Washington School

This group began meeting in November, 2008. Five teachers (1st, 2nd, 2 4th, and 5th grades) showed up very regularly for all meetings, except for occasional family/child care conflicts. They had significant support from one of the Title I math teachers, who serves as a mathematics leader within the school. He worked a second job, so typically could not come to the meetings. Two out of the first three meetings were cancelled because of weather, so the facilitator and teachers decided to re-group in January.

Each meeting was attended by 2-6 parents, often with their children. The structure of the meetings was to first "do math" together (teachers, parents, and children) and then to discuss ways to increase parent-teacher engagement. Keeping in mind the "playing with science" theme from the Palmer case, most of the math provided by the facilitator for participants to do together was in the form of math activities that are not traditionally done in school – puzzles, games, tangrams, etc. There were a number of positive results and stories that emerged from this aspect of the meetings. For instance, one father was very good at a particular kind of spatial puzzle and, after observing his success with these puzzles, both the teacher and his own children began to position him as having increased expertise in mathematics. Children from the 2nd-grade class began taking the puzzles back and forth between home and school and other children in the 2nd-grade classroom (whose parents were not involved in the initial teacher-parent meetings) began asking for copies to take home. One family, in which the parents spoke only Spanish, worked back and forth with their child and one another to complete a Magic Square, with the child and one of the facilitators translating the "rules" of the activity while the parents provided the mathematical knowledge.

The teacher-parent-child groups generated several interesting and ambitious ideas for increasing teacher-parent engagement, including developing a school store to work on money concepts and a school garden to draw on parents' expertise in carpentry and gardening with a focus on the mathematics involved in these activities. There were frequent discussions within the groups about designing artifacts that could move between home and school in order to increase parent engagement and connections between home and school. There was considerable concern about sending things home that would not be used and ideas were generated for addressing this concern. Out of these discussions, the plans for the Family Math Nights were developed. Ultimately, the group enlisted the Title I teacher's help in putting together two Math Nights – one for 1st/2nd grade and one for 4th/5th grade (reflecting the grade levels of the participating teachers and parents). They, along with the Title I teacher, designed the Nights to have parents and children rotate through 4 classrooms – each with a laminated game or activity that the parents and children would play in the classroom and could then take home with them (along with the necessary dice, counters, etc.). Ultimately, these Nights were very well-attended (particularly the 1st/2nd-grade night) by more than 200 children and family members and teachers were very positive about this outcome.

As researchers and facilitators, this case leaves us with several conjectures and questions. In particular, Family Math Nights were not the initially-intended outcome of the project and, in that sense, the outcome is a disappointment. On the other hand, having observed the Nights and the preparation that went into them and having interviewed the teachers afterwards, the Family Nights seem to have served several positive functions related to teacher-parent engagement. Specifically, the teachers had clear ownership of this project and they continued to hold Family Math Nights during the next school year without the formal support of the TE-PAC^2 project.

Teacher Stories about Teacher-Parent Engagement and Content

Initially, teachers' narratives about teacher-parent engagement were grounded in or mirrored the broader and more dominant cultural narratives of their schools. Teacher narratives, for example, focused on what it meant to teach mathematics or science in their particular school (and district) to their particular students, and what forms of parental engagement were appropriate or necessary. These cultural narratives organized teachers' discourse and practices related to what students (and parents) in their schools could accomplish, what good teaching was for their school's population, and who had the power and the right to make instructional decisions.

For example, at Washington School, teachers and parents all initially shared narratives of a general lack of parental involvement in the school, despite the school's clear mission and formal policies to engage parents and families. Some of the group's more ambitious ideas for teacher-parent engagement were rejected because of a conviction that parents at "this school" would not participate. Related to this narrative was an on-going discussion that the parents who "need" to be here (i.e., the ones whose children are struggling) were the not the ones who were participating.

This narrative at Washington School was situated in a broader cultural narrative related to the district's somewhat unique approach to mathematics teaching and curriculum. Although there was a set of standards and objectives for the district, there was no district-adopted textbook or set of curriculum materials. Instead, there was a strong and consistent narrative across the district related to teacher control over instructional and curricular choices in mathematics. This narrative was told in contrast to the district approach to literacy – a subject in which a scripted curriculum series had recently been adopted. Having an artifact in the form of common curriculum materials or even common activities/practices across classrooms might have helped focus the TE-PAC^2 group on examining these artifacts in order to identify "spaces" for teacher-parent engagement. The set of standards and objectives used in the district was somewhat too broad and abstract to serve this purpose.

As we can see with the teachers at Washington School, it was within these broader cultural narratives that teachers revealed how much their views of teaching and subsequent parental engagement in that teaching were framed by No Child Left Behind legislation and its extant policies and practices for mathematics and science teaching in their schools and districts. A school's status as failing or near failing and the supports and constraints this status imposed upon teachers were central to teacher narratives.

We noticed similar constraints at Beacon School. Interestingly, even when teachers had expressed views of learning that ran counter to cultural norms or formed fairly robust relationships with parents, who were highly active in the school, their more personal ideas about how teachers and parents might collaborate on instructional decisions were trumped by their perceptions of acceptable institutional practices and needs. For example, while the lead fifth grade teacher at Beacon held an expansive view of learning, which included views on how she might integrate youth interest in social networking technologies, she also spoke openly about not being able to trump the institutional narrative at her school due to the students' low test scores and school expectations for what classroom teaching ought to look like. At the same time, she had a fairly robust relationship with the one of the parents involved in TE-PAC^2, and yet while both she and the parent had ideas for ways to incorporate local cultural knowledge into the curriculum (i.e., incorporating oral histories or folklore into a lesson on predicting weather), they deprioritized these ideas to take on more traditional tasks supported by the broader cultural narrative. The day the lesson plan involved the students interviewing the parent on her "rules of thumb" for weather, the parent ended up not coming to science class because she felt it was more important for her to help oversee the lunch period in the cafeteria. The teacher felt she could not ask the parent to leave the cafeteria because that was the parent's "real" role in the school.

Changes in Teachers' Narratives: Counter-Stories

We found that having opportunities to study science and mathematics together (through curriculum materials and reform documents) provided a space in which teachers began to try out narratives regarding mathematics and science instruction and parental engagement that ran counter to the broader institutional and cultural narratives. These counter-narratives were deeply grounded in the instructional content - either in how the goals for teaching content were framed, what the content of the lessons looked like, or how school and home could connect content. These counter-narratives were strikingly different from the original narratives teachers told. The original narratives focused on the spaces – or lack thereof – for parent engagement in mathematics and science instruction. As part of the TE-PAC^2 experience, teachers began to see new roles and identities for parents. This allowed the teachers to then imagine new narratives for teaching and learning mathematics and science. These counter-stories were supported by non-routine resources made available within these communities (e.g, family stories) and/or new meanings given to traditional resources (e.g., Family Math Nights). Finally, these counter narratives were co-authored and constructed/re-constructed over time as parents and teachers took greater risks in sharing ideas and perspectives (e.g., building an understanding of and then an opposition to district policies over several weeks as parents and teachers realized they shared similar concerns).

Engaging in the study of science and mathematic curriculum and reform materials supported opportunities for teacher learning by shifting the spaces in which teachers and parents typically engage each other. Instead of interacting over individual student issues or becoming involved in the management of the classroom, studying science and mathematics curriculum and reform materials together provided opportunities for sustained dialogue on science and mathematics in everyday lives and shifted discourse from expert/novice to co-learners. In other words, these shifts in spaces altered the resources and roles available to parents and teachers allowing them to take up alternative narratives that countered the cultural norm. Teachers' views on resources for learning shifted as they began to view parents in a more collaborative way. Some of the teachers expanded their repertoire of resources to support their teaching and student learning when they began to understand that parents were more than recipients of information or experts only on their own kids.

At all of our sites, parents and teachers' collaboration eventually served as a somewhat safe space for critical discourse on school policies, and in two cases such discussions led to opportunities for teachers and parents to subvert aspects of school policy that they collectively agreed worked against children's learning. In both cases the policy subverted related to the allocation of instructional time: In one case (Palmer) ignoring the superintendent's call for no interdisciplinary teaching, and in a second case (Beacon) ignoring the school mandate to eliminate all instructional time for science. At the third site (Washington), these discussions led teachers and parents to carve out a space for parent engagement in mathematics that was notably and explicitly resistant to the dominant curricular and parent engagement policies that had been created with respect to literacy. Also at Washington, the high attendance at the Nights provides a "counter-story" to the clear belief and expectation of both teachers and parents that parents at this school do not participate in school events, particularly those related to content.

A Cycle of Teacher Narratives

If we think about teacher learning about teacher-parent engagement as a trajectory, we conjecture teachers made important movement along the trajectory, but that movement was mediated by the social context (i.e., school level support for science, teaching morale) along with teachers' personal resources for learning (i.e., teaching identity and knowledge of content). Teachers in all three schools experienced a culture of regulation and disempowerment and/or exhaustion among teachers. In fact, this trajectory cannot be understood separate from trajectories related to teachers' understandings of what it means to teach mathematics and science in their particular school and district. In proposing a trajectory of teacher learning about teacher-parent engagement, we claim that the center of this trajectory is defined by a cycle of teacher narratives (Figure 1) in which narratives of teacher-parent engagement are initially situated in broader cultural narratives about mathematics and science education and the role of parents. However, as teachers exchange resources with parents in the spaces defined by the TE-PAC^2 experience, they begin to tell counter-narratives not only about teacher-parent engagement, but also about the teaching of mathematics and science more broadly. In other words, teachers' narratives shift from questions of where parents might "fit" within the traditional teaching of mathematics and science to how new understandings of parent engagement might transform the teaching and learning of mathematics and science.

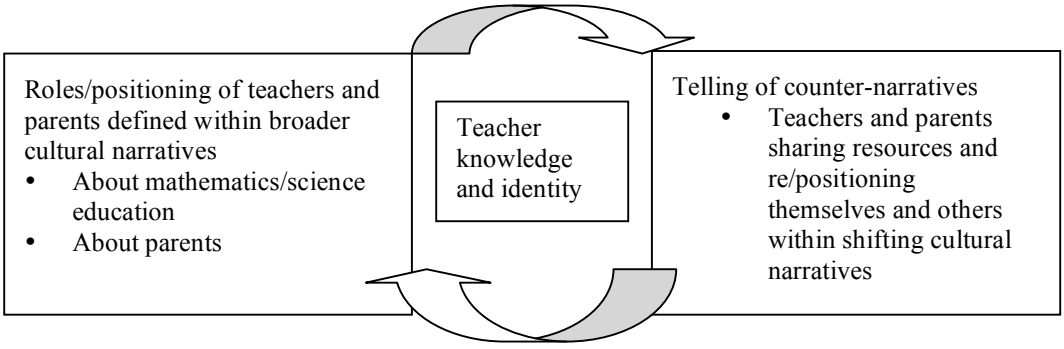

Figure 1. Cycle of Teacher Narratives.

At Beacon, we see the teachers as positioned at an early point along this trajectory. The teachers at Beacon were less familiar with the new science standards and also had no school-purchased resources for science. They tended to use the environment as a shield to prevent further engagement with parents. The initial narrative that emerged among teachers and parents in the context of *content* explorations focused on the "troubles of the school" that positioned teachers and parents differently and sometimes in opposition rather than the content of instruction.

Teachers at Washington and Palmer appeared to be positioned further along the trajectory as they were better able to take advantage of opportunities to learn with and through parental engagement and engage in the iterative cycle of narratives depicted in Figure 1. For example, at Palmer, teachers used the TE-PAC^2 experience as an opportunity to cultivate allies to work against policies that they felt worked against meaningful student learning. They used the TE-PAC^2 space to share complaints and to strategize on how to work against the negative environment. At both Washington and Palmer, teachers' relationships with parents as people with experiences that matter in science and mathematics developed dialectically with their views on the kinds of resources that support student learning. Consequently, teachers shifted classroom practice to reposition parents with more authorship in the classroom and/or curricular space. Parents helped to design extension lessons and served as content experts. They also provided feedback on their children's responses to the classroom. However, in this hybrid community, teachers still maintained overt control over when and how parents' shifting roles became public, even though many of the teachers expanded their views on what was possible in their school or classroom. Going forward, we hope to continue to understand, both theoretically and practically, the nature of this trajectory and ways to support teachers and parents in moving along this trajectory towards creating broader spaces and capital exchanges for engagement in the teaching and learning of mathematics and science.

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Acknowledgements

This work was supported, in part, by a grant to the two authors from the Spencer Foundation. Any opinions, findings, conclusions, or recommendations are those of the authors and do not necessarily reflect the views of the Spencer Foundation.