Government Policy, School Administration, & Teaching: Policy Implementation and Infrastructure

James P. Spillane

Northwestern University

The Distributed Leadership Studies
http://www.distributedleadership.org

Funded by National Science Foundation, Spencer Foundation, Institute for Education Sciences, & Carnegie Corporation
Changing Educational Policy Sector

• Local, state, and federal policymakers focus on instruction

• Policy discourses and texts press for -
  
  • Standards
  
  • Test-based accountability
  
  • Monitoring and measuring individual & organizational performance using student achievement tests
  
  • Instructional transparency and surveillance choice

(Fuhrman, Goertz, & Weinbaum, 2007; Mehta, under review; Rowan, 2006)
Ideals: Visions for Teaching & Learning

-Intellectually Rigorous Instruction
  - Balancing principled and procedural knowledge
  - Engaging students in ‘authentic’ disciplinary process
  - Intellectually rigorous instruction for all students

-Realizing the ideals in classrooms:
  - Academic tasks
  - Classroom Discourse
Today’s Questions

• How do schools respond to changing policy discourses and texts?

• How do policy ideals become embedded in local school systems and schools?
Anchoring the Work
The Good, The Bad, & The Ugly

- Re-classify students to shape the student testing pool (Abedi, 2004; Cullen & Reback, 2006; Robinson, 2011)
- Increase students’ caloric intake on testing days (Figlio, 2002)
- Run test prep drills (Diamond & Spillane, 2004)
- Redirect resources to math and reading (Ladd & Selli, 2002)
- ‘Bubble kids’ (Booher-Jennings, 2005)
A View from the Past

- Classroom instruction loosely coupled or decoupled from:
  - The school’s formal administrative structure
  - Government policy
- School administration buffering instruction from external scrutiny

(Bidwell, 1965; Meyer & Rowan, 1978; Weick, 1976)
“We were just kind of casually saying that for the majority of teachers they all work very hard, but some of them get very low results when it comes to these achievement tests ... So this [Five Week Assessment] was a way to find out ‘Are they learning?’”

(Literacy coordinator)

“The [standardized] tests ... didn’t give us much information about what we could do to improve our scores because we received the results well after we could do anything about it. We thought that a more frequent assessment ... would tell us where the children were”

(Principal Williams)

“The Five Week Assessment enabled teachers to see assessment as a tool for letting them know what they need to work on in the classroom. That was the goal.”

(Literacy coordinator)
Coupling/Decoupling/Recoupling

Organizations are made up of interdependent components that are more or less responsive to, and more or less distinctive from, each other (Bidwell, 1965, Meyer & Rowan, 1977, Weich, 1976; Orton & Weick, 1990)

Coupling as a process rather than a static feature of [school] organizations (Orton & Weick, 1990; Hallett & Ventresca, 2006)
Overview

• School infrastructure redesign central in school leaders’ efforts at coupling government policy with school administrative practice and with instruction

• School leaders and teachers negotiate the meanings of instructional policy in designing and performing organizational routines

• In doing so, school leaders reach beyond formal positional authority to deploy various persuasion tactics

• Recognizing the centrality of organization and system infrastructure design and redesign for policy implementation
Research Methodology
## Research Approach: Study Sites

<table>
<thead>
<tr>
<th>School</th>
<th>Student Enrollment</th>
<th>Low Income</th>
<th>Black</th>
<th>White</th>
<th>Hispanic</th>
<th>Asian</th>
<th>Limited English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>1,021</td>
<td>97%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Baxter</td>
<td>1,127</td>
<td>66%</td>
<td>7%</td>
<td>47%</td>
<td>22%</td>
<td>24%</td>
<td>38%</td>
</tr>
<tr>
<td>Kosten</td>
<td>1,569</td>
<td>73%</td>
<td>8%</td>
<td>40%</td>
<td>19%</td>
<td>34%</td>
<td>48%</td>
</tr>
<tr>
<td>Kelly</td>
<td>261</td>
<td>90%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
### Research: Data Collection

<table>
<thead>
<tr>
<th>School</th>
<th>Interviews</th>
<th>Observations of Organizational Routines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>93</td>
<td>39</td>
</tr>
<tr>
<td>Baxter</td>
<td>48</td>
<td>25</td>
</tr>
<tr>
<td>Kosten</td>
<td>62</td>
<td>56</td>
</tr>
<tr>
<td>Kelly</td>
<td>16</td>
<td>11</td>
</tr>
</tbody>
</table>
Data Analysis

- **Phase 1:** In-depth school cases

- **Phase 2:** Closed closing of interviews using HyperRESEARCH (e.g., organizational routines, roles and responsibilities, policy)

- **Phase 3:** Closed coding of field-notes & meeting transcripts using NVivo (e.g., technical core, policy)

- **Phase 4:** Open and closed coding of 22 meeting transcripts from Adams School (e.g., policy, professionalism, social tactics). (Kappa ranged from 0.70 to 0.95)
Papers


Findings
Assertion #1

School leaders worked at aligning their school’s organizational infrastructure with government policy and with instruction by (re)designing organizational routines.

School leaders designed these organizational routines to promote standardization, accountability, & monitoring of instruction.
Organizational Routines

- **Organizational Routines**: “repetitive, recognizable patterns of interdependent actions carried out by multiple actors” (Feldman & Pentland, 2003)

- **Ostensive Aspect**: Ideal form — general idea or script of the routine

- **Performative Aspect**: Routine in practice in particular places, at particular times

- Concerns about the organizational routine construct — rigid, mundane, mindless, explicitly stored (M. Cohen, 2007)
ORGANIZATIONAL RUTINES
Designing Organizational Routines

- **Adams School:** Breakfast Club, Grade level meetings, Teacher Talk, Teacher Leaders, Five-Week Assessment, Literacy Committee, and Mathematics Committee.

- **Baxter School:** Cycle Meetings, Leadership Team Meetings, Literacy Committee, Math/Science Committee.

- **Kosten School:** Report Card Review, Grade Book Review, Lesson Plan Review, Faculty Meetings, Grade Level Meetings.

- **Kelly School:** Skill Chart Review, Professional Development.
# A Closer Look: The Case of Adams School

## Leadership Positions and Formal Organizational Routines at Adams 1988-2003

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Principal</strong></td>
<td>Dr. Williams</td>
<td></td>
<td></td>
<td>Ms. Richards</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Assistant Principal K-3</strong></td>
<td>Ms. Andrews</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Assistant Principal 4-6</strong></td>
<td>Ms. Richards</td>
<td></td>
<td></td>
<td>Ms. Wilmington</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Literacy Coordinator</strong></td>
<td>Ms. Tracy (returned to Adams in 1990)</td>
<td></td>
<td></td>
<td>Ms. Walsh</td>
<td>Ms. Kelly</td>
<td></td>
</tr>
<tr>
<td><strong>Literacy Assistant</strong></td>
<td>Ms. Smith (became assistant in 1996)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Literacy Teacher Leaders</strong></td>
<td>Ms. Baize</td>
<td>Ms. James</td>
<td></td>
<td>Ms. Kelly (hired 1996)</td>
<td>Ms. Walsh (hired 1997)</td>
<td></td>
</tr>
<tr>
<td><strong>New instructional routines introduced</strong></td>
<td>Grade Level Mtgs; Faculty Mtgs; School Improvement Planning</td>
<td>Five Week Assessment Breakfast Club Teacher Leader Literacy Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Organizational Routines at Adams School

<table>
<thead>
<tr>
<th></th>
<th>Functions</th>
<th>Tools</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five Week Assessment</td>
<td>-Formative evaluation</td>
<td>-Standardized Tests</td>
<td>-Language Arts Coordinator</td>
</tr>
<tr>
<td></td>
<td>-Teacher Accountability</td>
<td>-Standards</td>
<td>-Assistant Principal</td>
</tr>
<tr>
<td></td>
<td>-Monitor Instruction</td>
<td>-Student Assessments</td>
<td>-Principal</td>
</tr>
<tr>
<td></td>
<td>-Teacher Development</td>
<td></td>
<td>-Teachers</td>
</tr>
<tr>
<td>Breakfast Club</td>
<td>-Teacher Development</td>
<td>-Research Articles</td>
<td>-Teachers</td>
</tr>
<tr>
<td></td>
<td>-Build Professional Community</td>
<td></td>
<td>-Language Arts Coordinator</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Principal</td>
</tr>
<tr>
<td>School Improvement</td>
<td>-Identify Instructional Priorities &amp; Resources</td>
<td>-Previous Year SIP</td>
<td>-Principal</td>
</tr>
<tr>
<td>Planning (SIP)</td>
<td></td>
<td>-District Guidelines</td>
<td>-Administration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Test Score Data</td>
<td>-Teachers (approved LSC)</td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>-Teacher Development</td>
<td>-School Protocol,</td>
<td>-Principal</td>
</tr>
<tr>
<td></td>
<td>-Monitor Instruction</td>
<td>-District Protocol</td>
<td>-Assistant Principal</td>
</tr>
<tr>
<td></td>
<td>-Accountability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Men Read</td>
<td>-Student Motivation and Support</td>
<td>-Books</td>
<td>-Language Arts Co-ord.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Assistant Principal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Principal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Community Members</td>
</tr>
</tbody>
</table>
The Five-Week Assessment

“We were just kind of casually saying that for the majority of teachers they all work very hard, but some of them get very low results when it comes to these achievement tests … So this [Five Week Assessment] was a way to find out ‘Are they learning?’”

(Literacy coordinator)

“The [standardized] tests … didn’t give us much information about what we could do to improve our scores because we received the results well after we could do anything about it. We thought that a more frequent assessment … would tell us where the children were”

(Principal Williams)

“The Five Week Assessment enabled teachers to see assessment as a tool for letting them know what they need to work on in the classroom. That was the goal.”

(Literacy coordinator)
Five Week Assessment: Ostensive Aspect

Step 1. Literacy Committee Identifies Needs & New Directions

Step 2. Literacy Coordinator Plans Five Week Assessment Schedule

Step 3. Literacy Coordinator Develops Assessments

Step 4. Literacy Coordinator and Assistant Copy and Distribute Assessments to Teachers

Step 5. Teachers Administer & Return Assessments to Literacy Coordinator

Step 6. Literacy Coordinator and Assistant Score Assessments

Step 7. Literacy Coordinator and Assistant Compile and Analyze Scores

Step 8. Literacy Coordinator Shares Scores with Administrators and Teachers & Plans Future Assessments
The Five Week Assessment

“We’re still doing the Five Week Assessment, once that assessment is completed and graded and has been graphed and given back to the teachers, then we come back together with the teachers, with the grade levels and talk about the progress that was made. This last, well the 15th week results were not as well as we expected. … So we had a meeting with every grade level and we just talked about the results of the test” (Principal Robinson, 2002)
Formal positions, organizational routines as represented in formal documents and accounts

VS

Organization as experienced in day-to-day life of organizational members
Assertion #2

School leaders created organizational routines with which and within which they worked at selectively decoupling policy, administration, and instruction.

Policy featured both indirectly and directly in the performance of organizational routines as:

- School staff performed locally designed routines that more or less mirrored external policy in form and function
- Staff negotiated with policy in making decisions about instruction in performance of organizational routines
### Organizational Routine by Topic, by Grade

<table>
<thead>
<tr>
<th>Topic</th>
<th>Adams</th>
<th>Baxter</th>
<th>Kosten</th>
<th>Kelly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy</td>
<td>72%</td>
<td>67%</td>
<td>80%</td>
<td>73%</td>
</tr>
<tr>
<td>Technical Core</td>
<td>100</td>
<td>88</td>
<td>93</td>
<td>82</td>
</tr>
<tr>
<td>Technical Core &amp; Policy</td>
<td>72</td>
<td>67</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Language Arts</td>
<td>62</td>
<td>62</td>
<td>24</td>
<td>46</td>
</tr>
<tr>
<td>Math</td>
<td>36</td>
<td>10</td>
<td>17</td>
<td>36</td>
</tr>
<tr>
<td>Science</td>
<td>17</td>
<td>10</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>
Ms. Sally then switched the topic of discussion to a uniformed spelling program for the grade. She raised the point that it was important for the grade "to be following a sequence for instruction for phonics." Ms. Jill also wants to bring in one of her own favorite books into the curriculum which she claims has a "consistent format which is the most important because the students are missing a range of words. … Ms. Dalia then raised the point that she would be concerned that the grade would not be following the standards of the Illinois State in reference to the [Jill’s] book. [Grade Level Meeting at Baxter, 10/28/99]

Ms. Jones [mathematics teacher leader] remarks, “I don’t too much worry about this one [kind of] question. But now if it’s four or five questions [about the same content on the state test] I target in on that and I make sure my kids know that…” [Annual Kick-off Faculty Meeting at Adams, 8/31/01]

Organizational Routines: Performative Aspect
Next, Principal Johnson told the teachers that Ms. Ryan was going to go over how to read the ITBS analysis sheets from the 98-99 school year. ... She told the room that she handed out the Building Level Skills Analysis (BLSA) sheet to all the teachers and another sheet of Student Level Analysis (SLA) to the individual teachers. [After Ms. Ryan had finished] Ms. Ryan sat down and Dr. Johnson stood up again. Reiterating what Ms. Ryan had just said, Dr. Johnson stressed the importance to the teachers of "evaluating these analyses". "We do the curriculum before the test... Children have to have exposure to questions before the test... You [teachers] must refer to these [waving the analysis she had in her hand]." ... Dr. Johnson said, "Our children do well in the computation part but not as well in reasoning and higher-ordered thinking."

[Field notes, Professional Development Meeting at Kelly]
Organizational Routines as Local *Proxies for Policy*: The Five Week Assessment

First I would like to say congratulations to grade levels—all grade levels made some improvements from the Five Week Assessments to the Ten Week Assessment which is a reflection of your time and commitment to getting students to learn ... Third through fifth [grade] students need to work on their abilities to write descriptive words ... Probably lacking in vocabulary, ability to pick out details from the story. [Grade Level Meeting]

They [students] did a good job identifying the problem and solution of the story ... Which leads me to middle school. Problem and solution didn't always match ... this is truly a concern ... Little trouble determining the important information in the story. Questions most missed were vocabulary questions ... I have a packet with lessons on teaching vocabulary. I'll pass it around and if you want me to make you a copy, put your name on the green sticky note [Literacy Committee Meeting, Field Notes, 11/06/00]
Five Week Assessment: Performative Aspect

It [the Five Week Assessment] is first of all so Miss Richards, Miss Andrews and Miss Wilmington can see how the school is doing in general. That’s one of the purposes. And we get an idea of how we’re gonna do on our [state] standardized test. But the main point of the assessments are for teachers; that’s what they’re really for. They’re for you, so you can see what is happening in your classroom and you can see where the students seem to be struggling and you can think about what you need to do and discuss what you need to do to help them.

[Grade Level Meeting, 11/01/02]

“This is our own local assessment… It’s for our purposes and we’re not trying to meet any state mandate here, alright? Ultimately we have to, but this [assessment], this is for us to use to improve.” [Grade Level Meeting, 11/01/02]
Ms. Sally then switched the topic of discussion to a uniformed spelling program for the grade. She raised the point that it was important for the grade "to be following a sequence for instruction for phonics." Ms. Jill also wants to bring in one of her own favorite books into the curriculum which she claims has a "consistent format which is the most important because the students are missing a range of words. … Ms. Dalia then raised the point that she would be concerned that the grade would not be following the standards of the Illinois State in reference to the [Jill's] book. [Grade Level Meeting at Baxter, 10/28/99]

Ms. Jones [mathematics teacher leader] remarks, “I don’t too much worry about this one [kind of] question. But now if it’s four or five questions [about the same content on the state test] I target in on that and I make sure my kids know that…” [Annual Kick-off Faculty Meeting at Adams, 8/31/01]
“When we first started our Five Week Assessment Program, it was a good idea. But what we didn’t (do) was (plan) follow-up conferences with the teachers. So the teachers would give the test, get the results and put them down. And … there was no interaction after that. The first year … there was no difference (in test scores). As we looked at what we did, we finally came to the conclusion– what was missing was we didn’t find time for the teachers to talk about the results of the Five Week Assessment”

[Principal Interview, 03/01/00]
A Puzzle from the Field

Everybody did absolutely their own thing as far as literacy. Some people used the Basal series ... we had different Basal series going in the building. A lot of people were going to a literature-based instruction. Nobody ever talked to each other. It was just - everybody went into their own room, closed the door and did their own thing.”

(Adams Principal)

“There may be four classes at a grade level and they did not even talk. They did not have a clue at what was going on in each other's classrooms …”

(Baxter Teacher)

When I first started in 1991 [the principal] was very, very laid back, and we had a lot of creative teachers in this school, and you pretty much were able to do what you needed to do and use your creativity and kind of go with your own flow more or less.”

(Kosten Teacher)
Assertion #3

School leaders’ and teachers’ negotiations with and about policy meanings went beyond instruction as they discussed appropriate spheres of influence for policymakers, school leaders, and teachers.
Pushback in Practice: The Kosten Case

Mrs. Koh began “Kosten is a good school. The former administration did a good job, but we can’t take it for granted. Society is changing.” She continued, “We are putting those preventative resources in place. Why should we wait for a disaster?” Then she told the teachers, “You’ve got to have higher expectations, … a teacher quickly interjected, “But our scores are going up.” Mrs. Koh responded, “But our students are changing, and we want to insure that everyone is going up.” But then another teacher responded with a different interpretation: “We’re getting more and more kids now with problems at home. There’s no discipline in the household, and I can model things here, but if they don’t get it at home...” (Field notes).

Koh tells them the school needs to do something to improve reading, because their scores are down “1.3” on the IOWA tests. In contrast, the reading scores at the other neighborhood school are at 70, “I have to go over there.” Teacher—“I’ll go with you,” and “They must be teaching to the test” because the two schools are “servicing the same population” (Field notes).
Assertion #4

School leaders work at getting teacher cooperation with their understanding of the entailments of policy by appealing to formal/positional *authority* and by using various social tactics to *persuade* teachers.

These tactics included agenda setting, asserting in-group identity, aligning, brokering, self-critique & appearing other-oriented.
## Authority and Persuasion

<table>
<thead>
<tr>
<th>Tactic</th>
<th>% routines code found in</th>
<th>Total # of code uses</th>
<th>Average code use per routine</th>
<th>% of overall coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligning</td>
<td>86% (19)</td>
<td>280</td>
<td>12.7</td>
<td>57%</td>
</tr>
<tr>
<td>Other Oriented</td>
<td>64% (14)</td>
<td>199</td>
<td>9.1</td>
<td>40.4%</td>
</tr>
<tr>
<td><strong>Authority</strong></td>
<td><strong>82% (18)</strong></td>
<td><strong>195</strong></td>
<td><strong>8.9</strong></td>
<td><strong>39.6%</strong></td>
</tr>
<tr>
<td>Brokering</td>
<td>73% (16)</td>
<td>154</td>
<td>7.0</td>
<td>31.3%</td>
</tr>
<tr>
<td><strong>Agenda Setting</strong></td>
<td><strong>86% (19)</strong></td>
<td><strong>145</strong></td>
<td><strong>6.6</strong></td>
<td><strong>29.5%</strong></td>
</tr>
<tr>
<td>Asserting In-group</td>
<td>68% (15)</td>
<td>92</td>
<td>4.2</td>
<td>18.7%</td>
</tr>
</tbody>
</table>
School leaders transformed their organizational infrastructure, (re)designing organizational routines that embedded emerging institutional ‘logics’ - standardization, accountability, monitoring, transparency.

These organizational routines also embodied particular representations of instruction and how to improve instruction.

In practice, these routines were not purely symbolic, involving decision-making about substantive technical matters, selectively coupling the technical core with administrative practice and policy.

School leaders worked at getting teacher cooperation by appealing to formal/positional authority and by using various social tactics to persuade teachers.
Aligning

Ms. Walsh [Literacy Coordinator]: …I don’t know how you guys felt as you read it but as I was reading it I was saying, ‘we’re doing that, we’re doing that.’

(Audience agrees.)

Ms. Walsh: You know this is pretty much nothing new to us…

Ms. Holmes [Math Teacher Leader]: Uh, when I read them the first thing I thought about was the 12 strategies…

Ms. Walsh: I’m glad you brought that up. That’s an excellent, important part of the article. It’s also about comprehension throughout the content areas. And we know that’s been our focus here at Adams for quite some time…

[Transcript, Breakfast Club, Adams School, 10/17/01]
Ms. Kelly: “We might have people coming in, they might re-do our whole curriculum, they might...you know whatever they think they need to do. And then Chicago [school district] you know would have a say so in that because this is coming right down from the state. So she [CAO] wanted to make sure everybody knew about that and we were real serious about doing whatever we can to help our students because who wants anyone to come in our school and tell us then how to teach and what we have to teach and so forth.”
Assertion #5

School and system infrastructure matters, shaping interactions about instruction among school staff.

Infrastructure redesign can transform interactions among school staff about instruction shaping - who talks to whom about what.
Two Studies of School Staff Social Networks

**“Cloverville” Study**
- One urban, midsize district in the southeastern United States
- 30 participating schools, K-6 (also middle and high schools)
- Principal Questionnaire (PQ), School Staff Questionnaire (SSQ), principal logs, observations, interviews
- Survey responses collected in Spring 2005, ‘07

**NebraskaMATH Study**
- One mid-sized district in Nebraska
- 14 participating schools, K-6
- School Staff Questionnaire (SSQ), administrative records, test data, interviews
Social Network Instrument

Screen Shot from SSQ - Math Advice Questions Page 1

During THIS SCHOOL YEAR, to whom have you turned for advice and/or information about CURRICULUM, TEACHING, and STUDENT LEARNING? Please write full first and last names. You do not need to fill all the spaces. Please consider all forms of communication including face-to-face, via e-mail or telephone, etc., and include individuals across content and school/district/outside roles. You may list people you named as your close colleagues as well.

☐ I have not sought advice from anyone. Do not check this box if you provide a name(s) below.

1) James Spillane
2) Megan Hopkins
3) Katie Mertz
4) 
5) 
6) 
7) 
8) 
9) 
10) 
11) 
12) 

Please Note: No names or identifying information will ever be revealed in reports produced from these data.
Network Centrality Measures

- **Degree Centrality**
  - *In-degree* = the number of people who sought out and actor for advice or information
  - *Out-degree* = the number of people that actor sought out for advice for information
- **Betweenness centrality** = the extent to which an actor links two other actors in the network
  - A measure of *brokering*

\[
C_B(n_i) = \frac{\sum_{j<k} g_{jk}(n_i)}{g_{jk}}
\]
Advice and Information Interactions

Woodpecker Math Network 2011-2012
The level 1 model is:

$$\log \left( \frac{p[\text{advice}_{ij}=1]}{1-p[\text{advice}_{ij}]=1} \right)$$

\[= \alpha_j + \beta_i + \delta_1 (\text{Prior relationship})_{ij} + \delta_2 (\text{Same race})_{ij} + \delta_3 (\text{Same gender})_{ij} + \delta_4 (\text{Common grade taught})_{ij} + \delta_5 (\text{Difference in professional development})_{ij} + \delta_6 (\text{Reciprocity: advice}_{ji}) \]
Network Selection Modeling: Multilevel p2

The level 2 model is:

Level 2a (j: provider effect)

\[ \alpha_j = \gamma_0^{(a)} + \gamma_1^{(a)} \text{New teachers}_j \]
\[ + \gamma_2^{(a)} \text{Multiple-grade teachers}_j \]
\[ + \gamma_3^{(a)} \text{Formally designated leaders}_j + u_{0j}. \]

Level 2b (i: seeker effect)

\[ \beta_i = \gamma_0^{(b)} + \gamma_1^{(b)} \text{life/career stage}_i \]
\[ + \gamma_2^{(b)} \text{Professional development}_i + v_{0i}. \]
Formal Organizational Structure and Teaching Advice & Information Interactions

- Teachers more likely to seek advice from others of same gender and race
- Prior tie strongly associated with having a current tie
- Formal leaders more likely to provide advice or information
- Teachers in the same grade more likely to receive or provide advice or information
- Teachers more likely to seek advice about a subject from teachers who reported more PD in that subject

District Infrastructure Design for Teacher Leadership: The Case of Auburn Park

- Infrastructure for mathematics instruction
  - New Inquiry-Based Elementary School Mathematics Curriculum
  - Resource and material adoption (investigations)
  - State standards alignment
  - Unit assessment development
- Infrastructure (re)design for teacher leadership
  - District-wide and school specific organizational routines (e.g., arrays, toolbox, PLCs).
  - Math coaches in some schools
  - Professional development in math for select teacher leaders
Math Coach Transforms Interactions about Mathematics Teaching (Bryant Elementary)
“[Emily] really wasn’t our facilitator [last year], though she was my co-worker, just a third grade teacher. I knew she had a wealth of knowledge, I just wasn’t in [her classroom] when she was teaching math. But, now that she’s moved into this math facilitator position, that’s different…She’s been trained in it. And, she’s gone to school for it and she’s a great coach. She knows a lot about math and I trust her that she has a lot of, a wealth of knowledge… She’s the go-to person.”

Angie, Special Education
Professional Development & Teacher Leaders for Mathematics (John)
Teacher Leadership and Training as a Marker of Expertise

“Because he’s a second grade teacher….He’s kind of become the math person to see because he’s taken this extra training that nobody else in the building has done, and I know that he’s interested in math so, he’s just one that I’ve gone to that I know focuses very heavily on, I like his beliefs and the way that he has his room set up and the way that he carries himself.”

Karen (1st grade)
Infrastructure Redesign Promoted Advice and Information Seeking in Mathematics

Average In-Degree for Teacher Leaders and Other Teachers, Auburn Park School District

<table>
<thead>
<tr>
<th></th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbox Members (6)</td>
<td>1.60</td>
<td>2.80</td>
<td>2.67</td>
</tr>
<tr>
<td>Fundamental Math</td>
<td>4.33</td>
<td>6.00*</td>
<td>6.00</td>
</tr>
<tr>
<td>Participants (9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Coaches (3)</td>
<td>6.33</td>
<td>16.33**</td>
<td>18.00</td>
</tr>
<tr>
<td>Other Teachers (256)</td>
<td>1.54</td>
<td>1.60</td>
<td>1.36</td>
</tr>
</tbody>
</table>
## Infrastructure Redesign Promoted Brokering in Mathematics

### Average Betweenness for Teacher Leaders and Other Teachers, Auburn Park School District

<table>
<thead>
<tr>
<th></th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbox Members (6)</td>
<td>5.00</td>
<td>75.80*</td>
<td>48.86</td>
</tr>
<tr>
<td>Fundamental Math</td>
<td>32.44</td>
<td>144.33*</td>
<td>115.42</td>
</tr>
<tr>
<td>Participants (9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Coaches (3)</td>
<td>38.67</td>
<td>248.67**</td>
<td>222.97</td>
</tr>
<tr>
<td>Other Teachers (256)</td>
<td>10.85</td>
<td>24.81*</td>
<td>11.90</td>
</tr>
</tbody>
</table>
# Teacher Leadership as a Coupling Mechanism

## Change in Teachers’ Beliefs about and Reported Practices in Mathematics

<table>
<thead>
<tr>
<th></th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beliefs about</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics Instruction Mean (SD)</td>
<td>3.35</td>
<td>3.46***</td>
<td>3.51***</td>
</tr>
<tr>
<td></td>
<td>(0.5)</td>
<td>(0.5)</td>
<td>(0.5)</td>
</tr>
<tr>
<td><strong>Reasoning and</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem-Solving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practices Mean (SD)</td>
<td>2.39 (0.4)</td>
<td>2.52***</td>
<td>2.64***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.4)</td>
<td>(0.5)</td>
</tr>
</tbody>
</table>

**Notes:** Means are based on teachers from 12 schools with over 70% response rates who responded in every year of the survey. Significant differences are for comparisons to 2009-10. ***p<.001; **p<.01, *p<.05; +p<.10
Conclusion

• Successful implementation of policy ideals ultimately depends on local practice and practitioners.

• We have to attend not only to classroom practice but also practice at other levels of the education system.

• We cannot design practice, we can only design for practice…

• School and system infrastructure design and redesign are essential in transforming practice…
System and Organizational Infrastructure
More At:

- http://www.distributedleadership.org
- http://distributedleadership.org/DLS/Presentations.html