CATALYZING NETWORK EXPERTISE

YEAR 1 REPORT

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STUDY OVERVIEW

The primary goal of this study is to examine change linked to new institutional pressures on schools brought about by the threat of sanctions under the federal *No Child Left Behind Act (NCLB).* The NCLB legislation dramatically increased the external pressure on schools for improvement; in particular, for the first time in the history of public education, schools were to be held accountable not just for overall achievement levels but for achievement of all subgroups in their schools. This research seeks to develop and test models that integrate accounts of individual and organizational change in response to the pressures exogenous to schools that emerge from NCLB.

In this study, our principal question is "How do social processes and structures formed during the implementation of earlier reforms and innovations enable and constrain teachers' responses to new institutional forces?" This question calls for attention to organizational level factors that affect interactions, the formation of interactions in response institutional pressure and how those interactions affect teachers' behaviors. Therefore, we ask:

- How do formal opportunities for shared decision-making and informal opportunities for collaboration carry over or shift as a wave of pressure begins to take hold?
- How do interactions teachers draw on to respond to new institutional forces emerge from interactions regarding earlier reforms?
- Which interactions, experiences and attributes that emerged through prior reforms are most strongly related to teachers' responses to new institutional forces?

Methods

Data collection for this study includes longitudinal data on teachers' classroom teaching practices, principal and other administrative leadership behaviors, and social networks among faculty. The majority of this data will be collected using questionnaires. Analysis will include a combination of case summaries of the effects of the school leadership practices on organizational functioning, social network analyses to model selection of ties and change in networks over time, and multi-level models to test the influence of network ties and individual characteristics on teacher change.

Timeline

Data collection will proceed over the course of the 2006-07 and 2007-08 school years. We will spend 2008-09 analyzing the data. During fall 2006, we will administer a principal interview

to gather data on the institutional contexts of NCLB-related activity within each school and on the strategies schools are adopting to respond to NCLB. In spring 2007, we will gather social network data with a principal questionnaire and a faculty questionnaire. In spring 2008, we will again gather social network data with a principal questionnaire and a faculty questionnaire.

From summer 2008 through spring 2009, we will test our working models relating individual and organizational change and prepare manuscripts and presentations to disseminate our results. As we prepare our analyses, we will call on specific advisory board members for alternative interpretations of our findings, and we will prepare an overview of findings for them to review at a joint meeting. We will prepare manuscripts for journals in sociology, management, and educational policy and submit proposals for presentations with findings from our study to conferences in these disciplines. Finally, during spring 2009 we will also present results to school leaders and school improvement teams at our sample schools and prepare one or two manuscripts or presentations that would be relevant to school administrators.

ACTIVITY 1: Recruiting Schools

Goals/Design

Data collected during a previous study REC-0231981 identified teacher networks in existence at that time (school year 2004-05) for the schools in that study. For this study, we planned to measure teacher networks in school year 2007-08, particularly in response to pressures from NCLB legislation. Our goal was to see the extent to which earlier networks, those identified in the previous study, persisted and affected teacher attitudes and behavior in 2007 at each of the schools. In order to tailor this study to the NCLB context, we planned to recruit the 12 of the schools from the previous study that would be most affected by NCLB legislation. These were the schools that received federal Title I supplemental funding to serve students from low-income backgrounds. Schools may lose this funding if they fail to meet the requirements of NCLB.

Methodology

Recruitment began in September 2006. An initial mailing was sent to principals at each of the 12 schools targeted for participation. The mailing included a cover letter addressed to the principal, a one-page summary of requirements for participation including faculty and school incentives, and a six page article entitled, *The New Science of Networks and the Challenge of School Change*. This article was written by PI William Penuel and Co-PI on the previous study, Margaret Riel, for an audience such as principals in order to provide a concise overview of our previous study findings about how social networks affect school change. The article also promotes the idea that principals may be able to utilize knowledge about networks in their school to increase the likelihood of implementation of new initiatives or reforms at their schools.

Three researchers conducted follow up after the initial mailing in late September 2006 with phone calls and e-mail messages to the principals. Response to our requests for participation varied, with some schools recruited within days and others unable to commit but willing to consider participation. Part of the difficulty stemmed from the fact that new principals had been hired since the 2003-06 Social Capital study at six of 11 schools, with two of these being both new principals and new to the school in fall 2006.

By early November, nine of the 12 targeted schools had agreed to participate. Of the three schools that did not agree to participate, only one declined after consulting faculty about their preference. Of the other two, one school was so unresponsive that we concluded they would not participate. The third school's principal indicated an interest in participation, but that principal was undergoing treatment for a serious medical condition and unable to follow through on that interest. To increase the number of schools participating and add potential comparison schools to the sample, two schools from the previous study that were unlikely to be influenced by NCLB legislation were recruited to participate. Table 1 below shows the characteristics of the schools in the study. The non-Title I comparison schools are marked with an asterisk.

Table 1. Demographic Information for Participating Schools

ID	Grade Span	Enrollment	FTE Teachers	Teacher Ratio	F/RP Meals†	English Learners	White
01*	K-5	418	23.8	17.6	3.8%	20.8 %	58.1%
03	K-6	1,191	61.5	19.4	92.4%	70.7 %	0.8%
08	K-6	503	27	18.6	14.9%	25.0 %	18.3%
14	K-8	647	28	23.1	84.5%	66.5 %	0.0%
26	K-8	529	25.3	20.9	49.8%	24.8 %	25.9%
39	K-6	499	28.1	17.8	53.7%	43.3 %	22.0%
45*	K-4	261	14	18.6	n/a	0.0 %	70.9%
47*	5-8	514	23.8	21.6	100.0%	1.9 %	76.8%
48	5-7	483	20.5	23.5	n/a	0.6 %	75.2%
53	K-4	332	16.5	20.1	100.0%	14.8 %	62.0%
54	K-5	277	17.8	15.6	51.6%	13.7 %	25.6%

† Percent of students eligible for free or reduced price meals is a measure of the proportion of students in a school who come from low-income families.

ACTIVITY 2: Principal Interview

Goals/Design

The first data collection in year 1 of the study was a principal interview. The interview was one of the requirements listed in the summary of the study provided with the initial recruitment mailing in September 2006. Principals were informed that the purpose of the interview was to explore each school's goals, plans, and strategies in relation to NCLB legislation. Data from the principal interviews would then inform items on the faculty survey administered in spring 2007.

Methodology

The research team developed the principal interview protocol in October 2006. Content areas for interview questions were first identified, with areas being assigned to individual researchers to draft specific items. The content areas included the following topics.

- The school's strategies in regard to NCLB legislation
- The school's resources for professional development in relation to NCLB initiatives
- District monitoring of school performance
- Incentives and/or sanctions from the district in regard to NCLB initiatives
- External pressures (e.g., teachers' union, parents)
- School governance practices
- Constraints or opportunities for the principal to choose teacher professional development experiences
- The principal's opportunities to leverage NCLB agreements with teachers

For the first two content areas, we used items from an previous study conducted by SRI regarding Title I (Laguarda et al., 2006). Other items were obtained from existing sources or developed by the researchers. The research team met and reviewed items in an iterative fashion. Once a draft interview was complete, it was piloted by telephone with an advisory board member from our previous study who had also been a school principal. The draft was then revised and questions dealing with teachers' unions were reviewed by two additional principals to ensure the legal context of California was accurately reflected in this set of items.

Three researchers conducted interviews with each of the 11 school principals from mid-November through early December 2006. Interviews were transcribed in January 2007. Along with the interview, principals completed a one-page set of ratings of the influence of NCLB legislation on school-level processes such as planning and budgeting, specific instructional

programs, testing and assessment of student achievement, teacher quality, and community relations. Review and summary of these data are underway.

ACTIVITY 3: Faculty Survey

Goals/Design

The faculty survey was the central data collection instrument of year 1. The survey included items developed during the Social Capital study, as well as items from another study conducted by SRI international examining NCLB implementation. The items included measures of school contexts, of the social networks within schools, and of individual change. School context items included measures of the labor relations environment within the school and the norms for collegial interaction. The social network items covered professional networks and help from colleagues regarding improving student achievement in reading and in mathematics. The measures of individual change included several areas: identification with the school, perceptions of individual expertise, the influence of NCLB on teaching practice, and the implementation of strategies in response to NCLB.

Methodology

Survey development began in December 2006 and continued through March 2007. Members of the research team identified or drafted items for one or more categories. Meetings were held to review and refine items and eventually reduce the survey length so that that it could be completed within 40 minutes. In addition, the advisory group members each provided input on survey items that should be included. To pilot the survey, we conducted 11 cognitive interviews (Desimone & Le Floch, 2004) with Bay Areas teachers to investigate specific study topics and improve the survey. Eight elementary teachers, two middle school teachers, and one special education teacher participated. SRI editors reviewed the survey and it was produced in the TeleForms system so that the completed surveys would be scannable. Surveys were printed with respondent name, obtained from the school faculty roster, and school name.

During recruitment of schools, principals were informed of the survey to the administered as part of the study. They were asked to schedule time for the survey to be administered by a researcher, preferably during a faculty meeting so that surveys could be completed and submitted during the meeting. Survey administration occurred during April and May 2007. There were no concerns about the items expressed during or following survey administration. In contrast, for the Social Capital study, a set of items regarding faculty perceptions of the principal had to be

removed from the survey after the survey administration at the first school. The principal at that school objected to the critical nature of the items leading the research team to remove the items to ensure other schools were not disturbed by the items.

Logging the completed surveys involved a number of steps. Each survey received was checked against the school roster to determine the school's response rate. Each name was also checked against the school roster from the Social Capital study. For those respondents who completed surveys during the previous study, ID numbers from that study were added to the new surveys so that previous and current data could be compared for those respondents.

ACTIVITY 4: Principal Questionnaire

Goals/Design

In addition to the principal interview, a principal questionnaire was administered in spring 2007. The primary purpose of the principal questionnaire was to collect social network data for each of the principals. In our previous study, we failed to collect data on principals' own networks; even though many teachers named their principal as a close colleague or source of support, we had no idea whether those ties were reciprocal. In the current study, then, we decided to collect information from teachers about their internal ties within the school, asking questions that paralleled questions on the teacher questionnaire (see description below). We also collected data on principals ties that were external to the school, so that we could better understand the resources they drew upon for responding to NCLB pressures.

Methodology

We developed the principal questionnaire in March 2007. Items were drafted by the co-PIs and reviewed by the rest of the research team. The questionnaire included two questions in addition to the social network questions. These two questions asked about support to teachers needing to attain highly qualified status under NCLB, and about the amount of pressure on the school in regard to NCLB from external sources, specifically, parents, district administrators, community leaders, and the media. The social network questions asked about both internal (within the school) and external (outside of the school) contacts used by principals to meet needs for resources in addressing the student achievement. Principals listed who they had turned to in the past year, specifically, the names of groups or organizations outside of the school, the titles or roles of individuals outside of the school, the names of groups and individuals within the school, and the names of teams or committees within the school.

We surveyed the principal at the same faculty meeting where we distributed the faculty questionnaire. Principals submitted their completed questionnaires to the researcher attending their faculty meeting. External contacts for each principal are presented in the finding section of this report. For within school contacts, principal responses will be included in the whole school analysis with the faculty surveys.

ACTIVITY 5: Analysis of AYP School Data

Goals/Design

Schools that fail to meet certain achievement targets receive sanctions under NCLB, depending on how many years they fail to meet these targets. States set these targets, but the federal guidelines state that 100 percent of students must be proficient in reading and mathematics by 2014. Schools that meet these targets are said to meet Adequate Yearly Progress (AYP) according to the law. After two years of failing to meet state-established targets for any subgroup whatsoever in the school, schools receive a needing improvement label. Therefore, as part of our activities, we collected data on each school with respect to its overall performance relative to targets set by the states and with respect to performance of subgroups specified by NCLB. Subgroups included as part of NCLB are students of different ethnic backgrounds, different income levels, English language learners and native English speakers, and students with and without disabilities.

Methodology

Research files from the California Department of Education (CDE). Since the 2001-02 school year, CDE has released electronic data files providing records of the Adequate Yearly Progress (AYP) Report indicators at the state, county, district, and school levels. The files are released in August and published at http://www.cde.ca.gov/ta/ac/ay/. Because of their large size, files are compressed and offered to the public as zipped files.

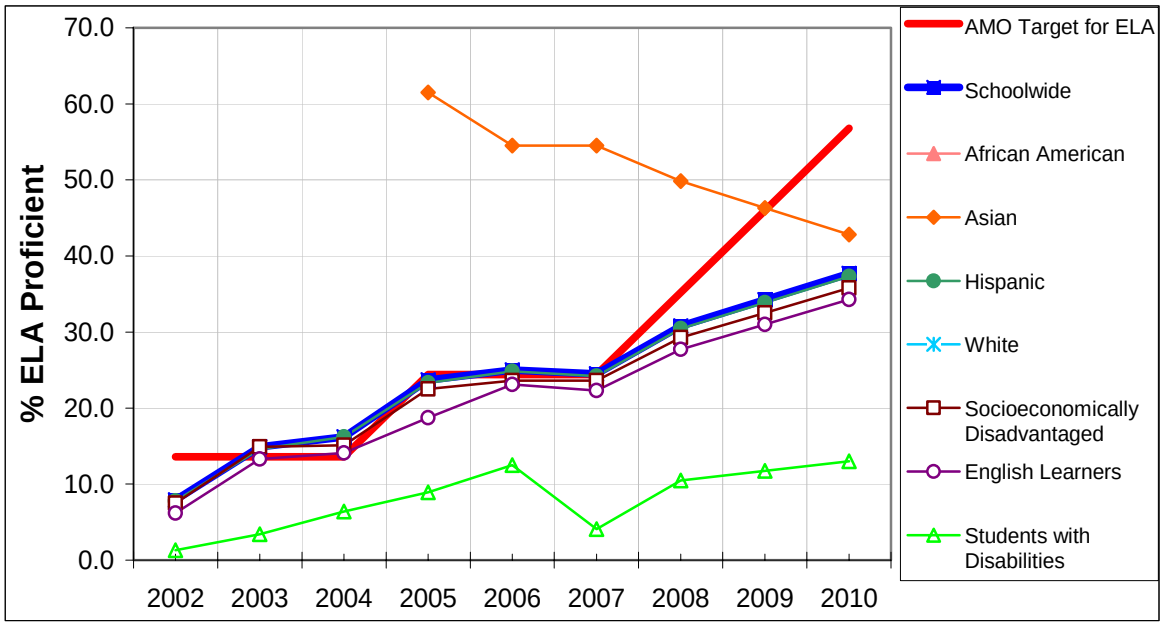
Downloading files from CDE. The California Department of Education AYP files from 2002 to 2007 were downloaded and unzipped. Unzipped files were loaded into a database tool to calculate the percent of students scoring proficient and above (PPA) for each school by student subgroup.

Extracting the indicators for CNE schools. A SQL query was created to extract the PPA students for each year by school and by subgroup. This data was loaded into an Excel worksheet to show the data longitudinally, as numbers and graphically, and to forecast the 2008-2010 trends by student subgroups at each school, based on a simple linear function to find the year of interception of the slope and intercept of the target

NCLB line with each school's predicted line. At the same time, we downloaded the Annual Measurable Objectives targets (AMO for ELA and Math) for years 2002-2010 from the *2006 Adequate Yearly Progress Report. Information Guide*, published at http://www.cde.ca.gov/ta/ac/ay/ayp2006.asp .

Forecasting Percent Proficient and Above trend and calculating year of interception with NCLB requirement. Using 2002-07 PPA data, we calculated the slope and y-intercept of the linear regression for student subgroups at each school. Using the 2007-2010 AMO, we calculated y-intercept and slope for AMO targets. Then we calculated the year in which the school subgroup line and the AMO targets line will intersect and transformed the data to date format in excel.

Figure 1. Sample School AYP Data Projection



ACTIVITY 6: Identification of Cohesive Subgroups in Schools

Goals/Design

Past research by Frank and colleagues (Frank & Zhao, 2005) has found that ties among teachers in a school tend to be concentrated within cohesive subgroups and that talk and help on instructional matters tends also to be concentrated within such subgroups. Further, new ties are strongly predicted by subgroup membership; in other words, new ties are more likely to form between previously unconnected members of a subgroup than between individuals who are members of different subgroups. Therefore, as a prologue to our analysis of how ties from earlier reforms influence patterns of interaction and behavior in subsequent waves of school reform, we first had to identify a set of cohesive subgroups within each school.

Methodology

To identify cohesive subgroups, we used data from our questionnaire to construct subgroup boundaries based on stable and enduring relationships between actors (Frank & Yasumoto, 1996). For our purposes, we used a sociometric question asking teachers to list their closest professional colleagues. Identifying subgroups across all the schools in our sample then required an algorithm that could objectively and successfully identify within-school subgroups from the sociometric question with a minimum of subjective input or interpretation from the researcher. We used Frank's (1995; 1996) network clustering algorithm for this purpose. Related to network models such as p* and p_2 (Lazega & Van Duijin, 1997; Wasserman & Pattison, 1996b), Frank's algorithm iteratively reassigns actors to subgroups to maximize the increase in odds that a relationship occurs between a pair of actors if they are in the same subgroup relative to the odds that a relationship occurs if they are in different subgroups. Defined in terms of Table 3, the odds ratio is

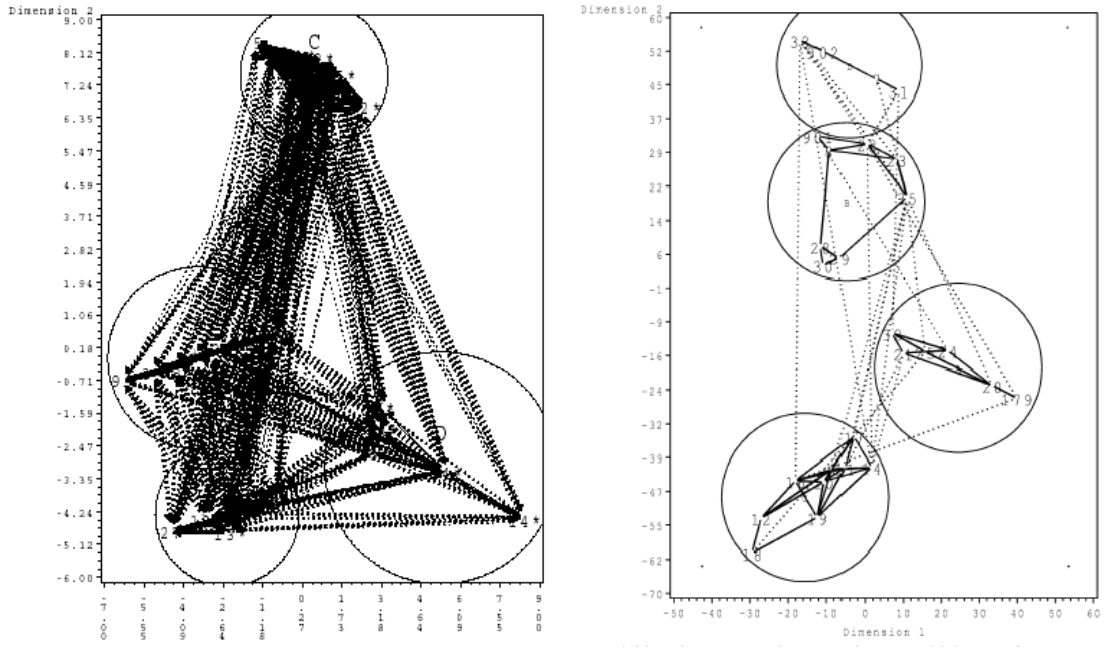
$$AD/BC = \frac{\text{(Absence of relationships outside of subgroups)*(presence of relationships within subgroups)}}{\text{(Presence of relationships outside of subgroups)*(absence of relationships within subgroups)}}$$

Thus, the odds ratio is large to the extent that relationships are concentrated within subgroups (as indicated by cells A and D) versus outside of subgroups (cells B and C).

This property makes it an ideal quantity to maximize to identify subgroups in which relationships are concentrated.

Using Frank's *Kliquefinder* software, we then constructed sociograms to represent visually the social distances between actors and subgroups. These sociograms are particularly useful when used in combination with case study data collected from schools in interpreting how resources and expertise can flow in a school (Frank, 1998). We now have constructed sociograms on the basis of sociometric data from two time points for the schools, allowing us to compare the social structures of a school at two different time points. Figure 2 below shows how two schools' networks changed from 2004 to 2007.

Figure 2. Sociogram for an Elementary School in the Sample (Left: 2004; Right: 2007)



In the sociograms, individual teachers are indicated by a number. Ties between teachers are indicated by lines connecting numbers; line thickness indicates frequency of interaction. Subgroup boundaries are denoted by circles. The circumference of the circles is an indicator of cohesion in the subgroup: smaller circumferences indicate more tightly-knit subgroups.

As these sociograms show, this particular school had a large number of ties in 2004, but the density of ties among faculty members was much less in 2007. The number of

subgroups was the same, but subgroup composition had changed somewhat, and each of the groups was slightly less cohesive. We know from case study data that this particular school is in a period of transition. It was a dual-immersion program intended to serve as a magnet school that would bring together native English and native Spanish speakers. The population is changing, and commitment to the school's dual immersion model is waning. The weakening of ties in the school, then, is not particularly surprising.

We are still in the process of constructing sociograms for all schools. As of September 30, 2007, we have constructed sociograms of 8 of 11 schools using the *KliqueFinder* program.

ACTIVITY 7: Modeling Selection

Goals/Design

Because we asked teachers to report both on enduring collegial ties and on help received related to their school's reform activities, we can analyze the degree of overlap between the two. Furthermore, because we asked both questions at two time points, we can analyze the degree to which informal ties and help related to the formal organizational goals of the school influenced the formation of new ties within the school. Because we also asked questions about interactions related to previous reforms and about help related to *NCLB*, we can also examine the extent to which earlier reforms influenced subsequent waves of reform. Our dataset, then, allowed us to model the influence of the informal social structure, past reforms, and formal organizational processes on the changing informal social structure of the school. The method for modeling the relative contribution of teacher background characteristics, formal organizational processes, and informal processes to the formation ties begins by constructing a *selection model* from our data (Frank, 1998).

Methodology

Our quantitative analyses of selection is focusing on changes in relationships between pairs of teachers (associated with research question 2, "How do interactions teachers draw on to respond to new institutional forces emerge from interactions regarding earlier reforms?), as well as changes in teachers' beliefs and behaviors as a function of interactions (associated with question 3, "Which interactions, experiences and attributes that emerged through prior reforms are most strongly related to teachers' responses to new institutional forces?**"**).

To examine how a school activates new networks, we will model the development of ties related to NCLB-strategies, such as data-based decision making. These will be multilevel cross-nested models, with pairs of school actors nested within nominators and nominees of ties. Rather than ignoring sets of dependencies as in the initial p_1 social network models (Holland & Leinhardt, 1981), or reducing dependencies to a set of characteristics of network structure as in the p^* models (Wasserman & Pattison, 1996a), the cross-nested multilevel p_2 approach accounts for dependencies with random effects for nominators and nominees and then models the random effects as functions of individual characteristics (Lazega & van Duijn, 1997).[1]

Formally, to address question 1, we are using data for only those pairs of school actors for which no help was provided regarding the implementation of practices associated with NCLB at time 1. We will then model whether *i* indicated receiving help from *i′* about help with STAR math (accountability) at time 2 as a function of the tendency of *i′* to provide help (nominee, $\alpha_{i'}$) and the tendency of *i* to indicate receiving help (nominator, β_i). The model for the pair of actors *i* and *i′* is (level 1 pair):

$$\log\left(\frac{P[Help_{ii'}=1]}{1-P[Help_{ii'}=1]}\right)=\alpha_{i'}+\beta_i \qquad (1)$$

To relate help about NCLB to the more stable social structure defined by close collegial relationships, we are including indicators for whether or not *i* and *i′* were close colleagues and whether they were members of the same subgroup (Frank, 1995, 1996; Frank & Zhao, 2005). To capture ascriptive formal and informal structuring, we are including dummy variables indicating whether school actors are taught in the same grade. To capture a balance effect (Davis 1967; Heider 1958; Newcomb 1961), we are including a term indicating the absolute value of the difference between *i* and *i′* in perceptions regarding the value of their school's previous initiative. Finally, to explore how the

[1] Thus only the *variances* of nominator and nominatee effects are specified. Correspondingly, the number of parameters does not increase with network size, making estimation more tractable.

previous implementation process transferred to talk about NCLB we will include a term for whether new interactions emerged between *i* and *i′* during the previous innovation:

Level 1 (pair)

$$\log\left(\frac{P[Help_{ii'}=1]}{1-P[Help_{ii'}=1]}\right)=\alpha_{i'}+\beta_i +$$

$$\delta_1\,(\text{close colleagues})_{ii'} +$$

$$\delta_2\,(\text{same subgroup})_{ii'} + \qquad (2)$$

$$\delta_3\,(\text{same grade})_{ii'} +$$

$$\delta_4\,(\text{difference in beliefs about previous initiative})_{ii'} +$$

$$\delta_5\,(\text{new talk about previous innovation})_{ii'} +$$

Pertaining to our first research question for the study, the larger the values of δ_1 and δ_2, the more we would infer that the network structure of social capital, formed as part of past implementation processes, enables and constrains individual access to expertise (question 1). Furthermore, the value of δ_5 quantifies how interactions that emerged during previous reforms influence from whom teachers seek help to implement strategies intended to help schools meet AYP goals. The value of δ_3 quantifies how access to expertise is shaped by the formal organization, and δ_4 is an example of how differences in attitudes towards previous reforms can shape new interactions.

We can then model whether new talk was more likely to emerge in certain schools by including schools as a set of dummy variables in the model of β_i and by including specific characteristics of teachers:

level 2b (i: nominator):

$\beta_{0j} = \gamma_{10} + \gamma_{01}$ dummy school $1_j + \gamma_{02}$ dummy school $2_j + + \gamma_{03}$ participation in shared decision-making$_j$ $u_{0j,}$ (3)

Thus, the term γ_{03} quantifies how participation in shared decision-making instituted by the school could affect a teachers' engagement in interaction regarding the implementation of reform (question 1). These dummy variables can then be used to identify schools in which new talk about the value of data-based decision-making was especially likely to emerge. They can then be interpreted in terms of the qualitative data, for example, for evidence of deliberate efforts of schools to promote collaboration among teachers across grades.

We have only preliminary results of these modeling activities to report at this time; more detailed modeling results will be presented for the next annual report.

We have estimated preliminary models in four of our schools, chosen because they represent a range of previous reforms. These models were reduced from the larger model:

Level 1 (pair)

$$\log\left(\frac{P[Help_{ii'}=1]}{1-P[Help_{ii'}=1]}\right)=\alpha_{i'}+\beta_i +$$

δ_1 (close colleagues)$_{ii'}$

δ_4 (difference in beliefs about previous initiative) $_{ii'}$ +

δ_5 (talk about previous innovation) $_{ii'}$ +

In each of the schools δ_1 and δ_5 were statistically significant. In each school δ_5 was negative, but not significant, although cumulatively across schools it approaches significance. Thus we find important evidence that help with response to accountability aligns with patterns of attitude and interaction established and during previous reforms.

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YEAR 1 FINDINGS OVERVIEW

Research Questions

The following section presents findings to date in response to the study's research questions. The overarching research question below is followed by three subsidiary research questions regarding organizational level factors that affect interactions, the formation of interactions in response institutional pressure, and how those interactions affect teachers' behaviors. Together these questions form the basis for exploring the relationship between individual and organizational change in the context of institutional pressures.

- How do social processes and structures formed during the implementation of earlier reforms and innovations enable and constrain teachers' responses to new institutional forces?
    - How do formal opportunities for shared decision-making and informal opportunities for collaboration carry over or shift as a wave of pressure begins to take hold?
    - How do interactions teachers draw on to respond to new institutional forces emerge from interactions regarding earlier reforms?
    - Which interactions, experiences and attributes that emerged through prior reforms are most strongly related to teachers' responses to new institutional forces?

FINDINGS 1: Principal Questionnaire

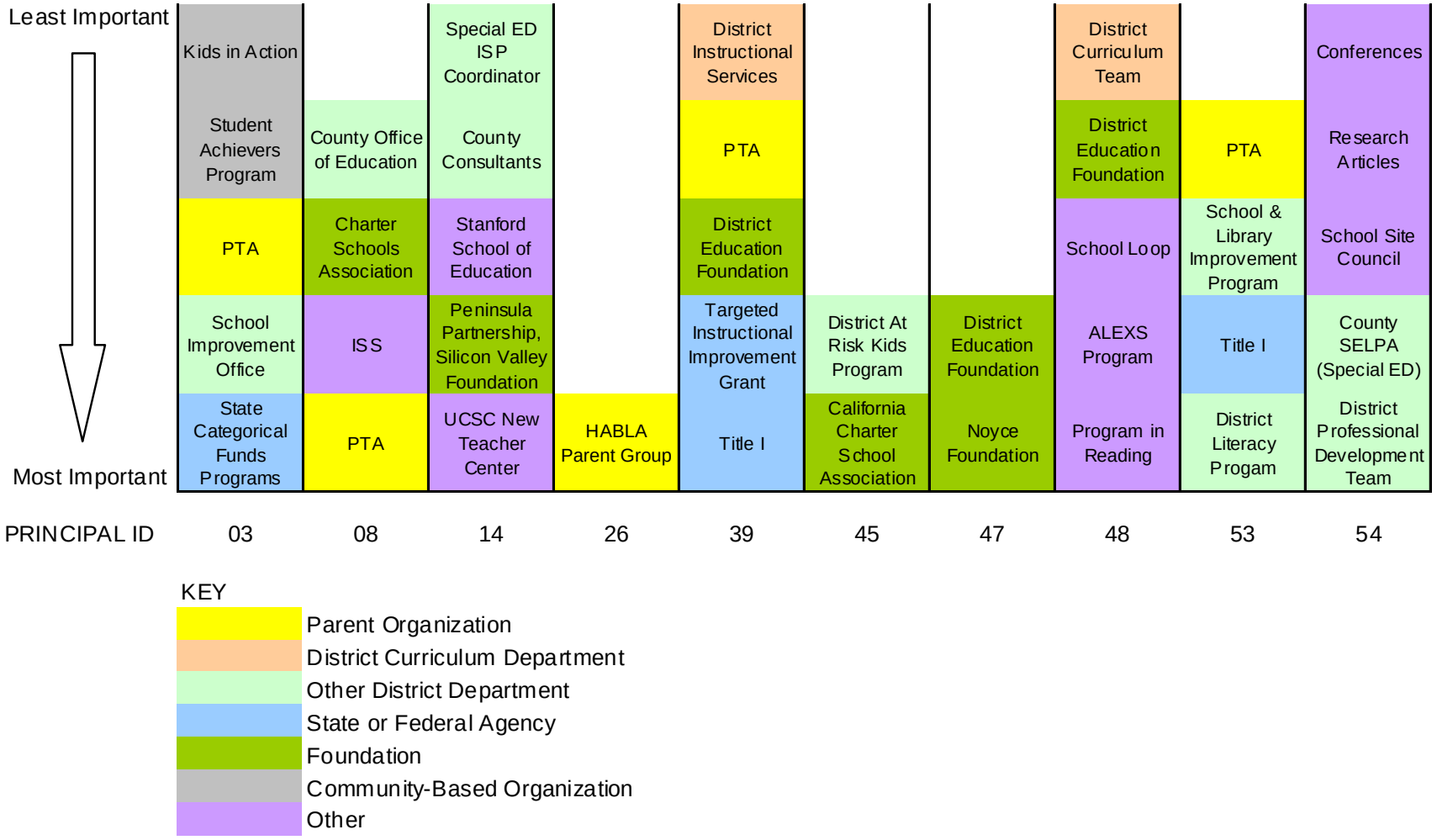
Principal Networks

KEY FINDING:

- Principal ties to external groups and organizations can be an important source of new ideas. These ties vary in range of groups and number of groups, however.

In our previous study, we did not collect data from principals regarding their networks outside of the school to which they turned for ideas and support. However, at the advice of members of our advisory board, we included in this study items asking principals about those external networks. Figure F-1 shows the differences in the size and range of principals' networks. The survey item requested principals to list in order of importance the names of up to five external groups or organizations that the principals had consulted in the past year. As shown in the figure, 5 of 11 principals listed 5 groups or organizations and 1 principal listed only one group. District departments other than curriculum (light green) were commonly listed, as well as foundations (dark green). Parent organizations were most important to 2 principals and listed by 2 other principals. State and federal agencies were important sources of support for 3 principals. District curriculum departments and community-based organizations were less common and not rated as important to principals as were other groups.

Figure F-1. Principals' External Networks by Type and by Group or Organization



FINDINGS 2: Cognitive Interviews for Survey Design

Teachers' Perceptions of NCLB Pressures

KEY FINDING:

- Many teachers and principals do not distinguish NCLB pressures from state and local pressures associated with a larger set of institutional forces: accountability-based reforms. Even specific requirements regarding teacher quality, which ostensibly affect their job status, are not distinguished by teachers.

This finding was surprising in that NCLB was "new" in its demand that schools be held accountable for performance of all subgroups and that all teachers hold a degree in the subject matter they taught. Before NCLB, California did not hold its schools accountable for high levels of achievement for each subgroup in a school. At the same time, accountability pressures on schools had been mounting for several years prior to passage of NCLB. Teachers had already adjusted in some ways to a tighter coupling between their classroom practice and organizational practice.

The basis for our preliminary conclusions about teachers' perceptions of pressures from NCLB were questions from our survey that asked teachers to draw on their knowledge of how NCLB is affecting their teaching. We used cognitive interviews to learn about how teachers' were interpreting our initial survey items, and teachers' responses revealed to us that teachers were not able to distinguish NCLB from state accountability pressures. With regard to assessment, for example, teachers describe pressure from the state and the district. NCLB is viewed negatively, but teachers do not distinguish between requirements for NCLB and requirements for state or district accountability measures. "I teach what I'm supposed to teach. I just don't know…we have these standards, I'm teaching to them, but how much does it connect to NCLB?", one 5th grade teacher asked. Another 3rd grade teacher said, "we don't know exactly where it's coming from or how it's related, we just know there is a lot of extra stuff."

With regard to their requirements for teacher quality certification, there was even less understanding of NCLB's role. Teachers were confused about which requirements, and how they were or were not related to NCLB. One teacher thought new requirements for certification were related to CLAD (California certification in Cross-cultural Language and Academic Development). Another idea was that trainings on curriculum materials might be related to NCLB. A few teachers said they do the kinds of things we asked about, but said they just do it, it's not in response to anything. Another said, "the requirements change so often, I'm not sure

what the new requirements are". This teacher said she just does professional development because it's part of teaching, but not in response to certification requirements. A 3rd grade teacher said questions about new requirements for certification reminded her of a form she'd filled out sometime back, but she was unclear what it was for or about. Just one teacher connected NCLB, new requirements for certification, and the debates about multiple subject teachers, but wasn't sure what the issue was, or the requirements.

These findings are significant, and they suggest ways that we will need to understand teachers' contexts and interpretations of NCLB pressures much better. In an important sense, they point to the importance of narrowing a focus on how teachers respond to NCLB to those aspects of the law that are distinctive, namely, the focus on subgroup achievement and on using data for instruction. These emphases were reflected in our current survey, but as we begin to write about study findings, these findings suggest some important ways that education policies figure in institutionalized environments that have not been conceptualized before. Typically, it is assumed that the pressure is exerted by a policy on local actors, but what we are finding here is that pressure exists in a more amorphous form in the larger institutionalized environment, in this case, of "accountability-based reforms," but individual policies are not salient in actors' minds.

FINDINGS 3: Faculty Survey

Analysis Overview

The target response rate for the faculty survey at each school was 80 percent. Each of the schools reached this target with 299 surveys completed across 11 schools. Table F-1 shows the number of faculty included in calculating the response rate, the number of surveys completed, and the response rate.

Table 2. Faculty Survey Response Rate by School

ID	Faculty Included	Surveys Completed	Response Rate
01	27	25	92.6%
03	62	52	83.9%
08	34	29	85.3%
14	32	26	81.3%
26	27	26	96.3%
39	37	35	94.6%
45	19	18	94.7%
47	32	30	93.8%
48	24	23	95.8%
53	19	17	89.5%
54	21	18	85.7%

Survey analysis included descriptive statistics for all items, and psychometric analyses for scales defined by previous theory. Social network analysis using KliqueFinder software began August 2007, with results for 7 schools completed before submission of this report. Results of social network analysis indicate modest clustering in most schools, but have not yet been analyzed in detail.

Repurposing of Grade Level Teams

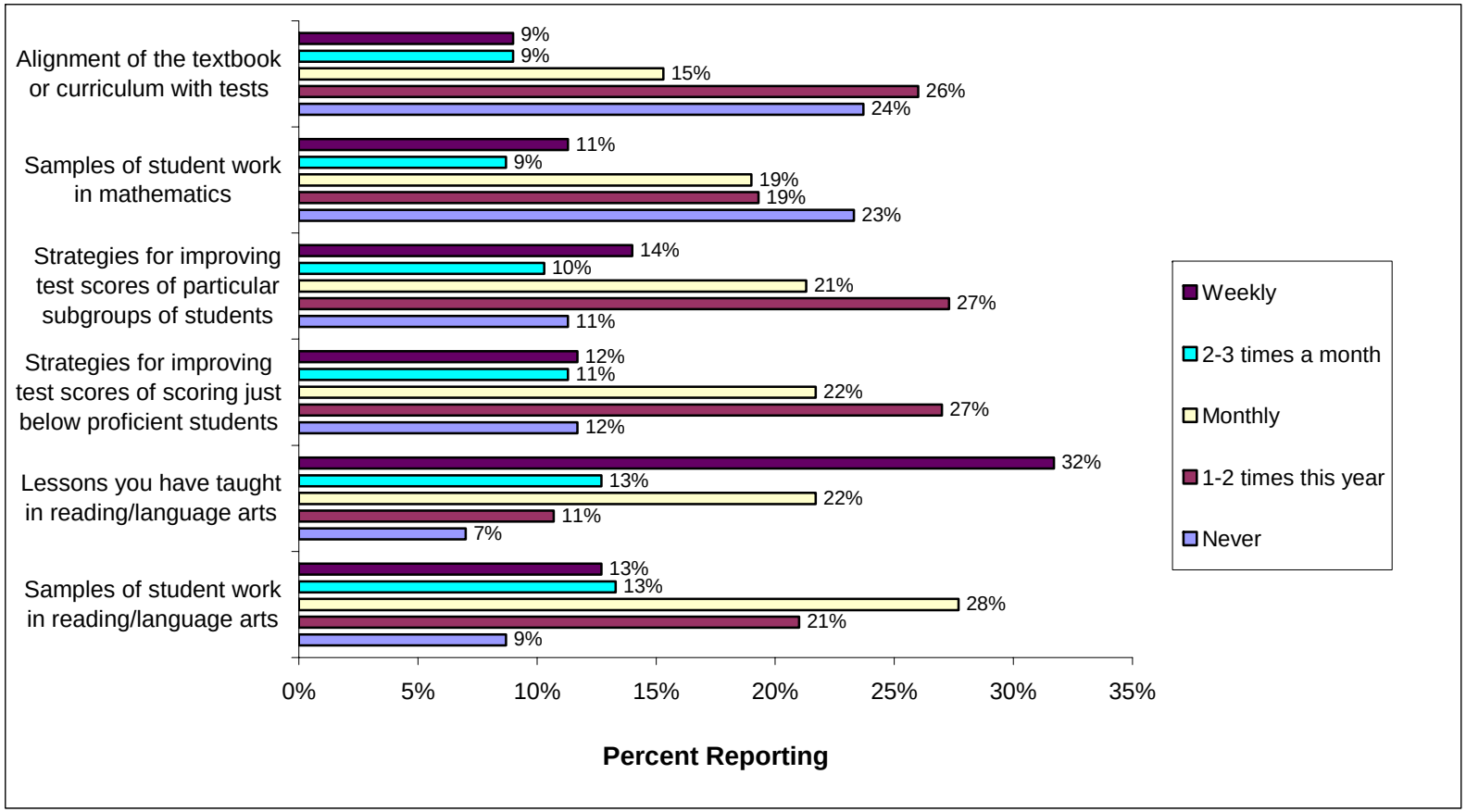
KEY FINDING:

- Organizational structures that emerged from school reforms in the 1980s and 1990s are now being used to discuss NCLB-related concerns including how to raise test scores of low-performing students.

Beginning in the 1980s, schools established organizational structures designed to reduce the isolation of teachers and promote greater teacher involvement in school-level decision-making. These structures had limited impact on teaching and learning but they have persisted. They include grade-level and vertical or across grade level teams that meet regularly to discuss curricular matters, common planning periods for teachers, and protocols and processes for structuring collaboration. Today, schools are using these organizational structures as forums for discussing strategies for improving the achievement of low-performing students, including underrepresented groups in the school.

Figure F-2 shows the topics addressed at grade-level team meetings across schools. The bottom group of bars on the graph shows the most common topic at monthly grade level meetings was review of samples of student work in reading or language arts. Over one-quarter of respondents (28%) reported discussing this topic. The least common monthly topic (15%), shown in the top groups of bars, was reviewing the alignment of a course textbook or curriculum with tests. The most common topic for all frequency levels is shown in the second to bottom group of bars; 32 percent of respondents reported discussing weekly lessons they have taught in reading or language arts at grade-level meetings.

Figure F-2. Frequency of Topics Discussed at Grade-Level Team Meetings Across Schools



The Proliferation of Interim and Benchmark Assessments

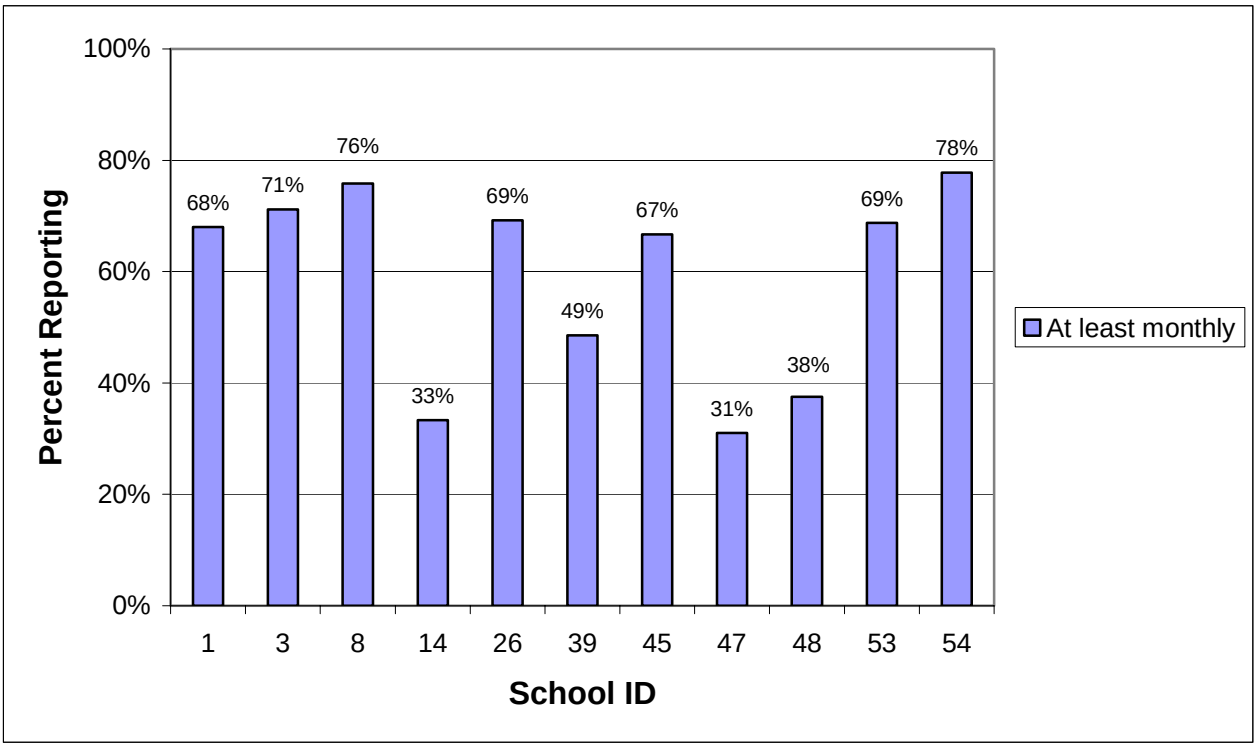
KEY FINDING:

- Some new organizational structures or procedures are linked to accountability-based reforms. These include the introduction and discussion of benchmark or interim assessments of student progress in schools.

As part of our previous study of teachers' social networks, we documented the emergence of a new type of activity in team meetings, the review of data on student achievement for the purpose of improving student achievement. Although some schools carry out this activity in specifically assigned data teams, other schools used, for example, grade-level or subject area team meetings to discuss regularly either interim or annual assessments of student performance. Schools adopted different strategies for helping students who were low-achieving, but the data review process was key to ensuring these strategies were discussed.

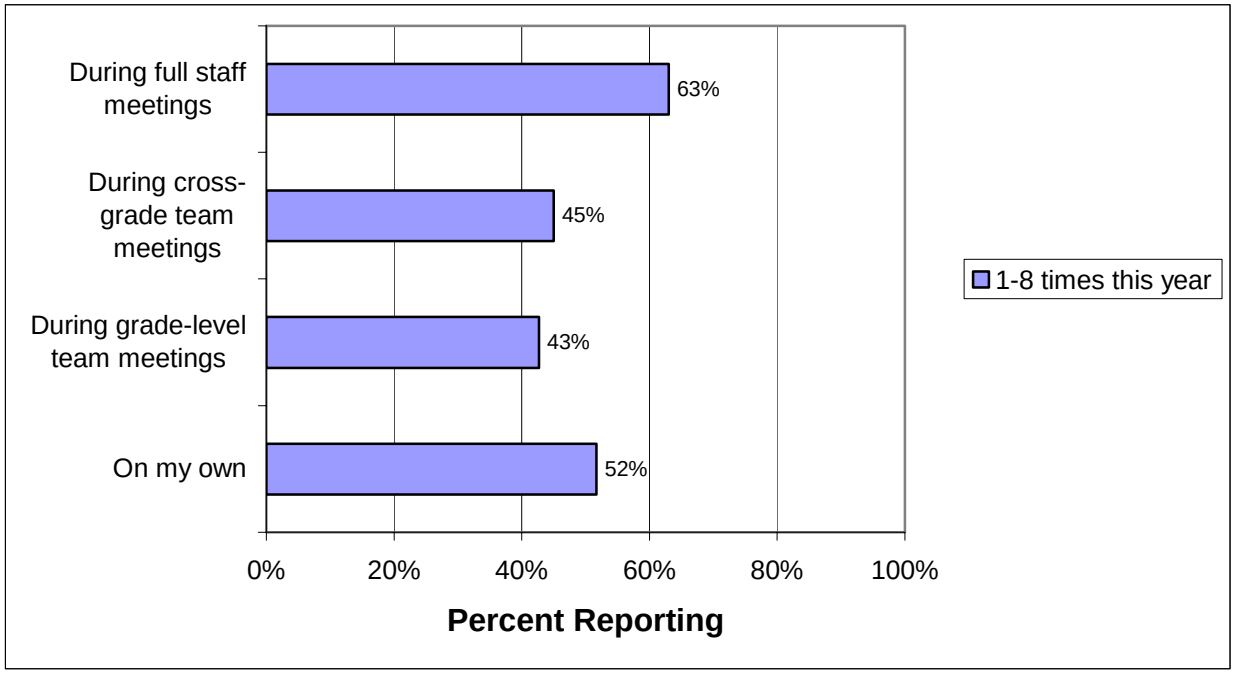
Figure F-3 shows that at 7 schools, two-thirds to three-quarters of faculty (67% to 78%) reported discussion of interim or benchmark assessment results at cross-grade (e.g., faculty) meetings. Of the remaining 4 schools, 49 percent of faculty at one school reported similar discussion and about one-third reported discussion at the other three schools (31% to 38%).

Figure F-3. Discussion of Interim Assessments at Cross-Grade Meetings by School



Annual achievement tests (from California's STAR testing program) were also the subject of discussion in team meetings. Figure F-4 shows the percent of faculty across schools who reported reviewing STAR data from one to eight times a school year either independently or in meetings with other faculty. Almost two-thirds (63%) reported reviewing STAR data at full faculty meetings, with close to half reporting review at cross-grade and grade-level meetings (45% and 43%). Over half (52%) also reported independent review of STAR data.

Figure F-4. Review of STAR Data by Setting Across Schools



Using student achievement data in decision-making is a challenging process. To be sure, teachers and schools have always used knowledge about student achievement in their thinking and planning for many aspects of teaching including curriculum, testing, and measures to assist students with learning needs not met in a typical classroom. However, these efforts have not necessarily been systematic or comprehensive. Contemporary reform efforts aimed at improving data-based decision-making call for a programmatic approach to using student achievement data in decision-making (e.g., Love, 2004).

Another indicator of the increasing importance of interim assessments and review of data is that teachers' received professional development on these topics. Table F-2 shows faculty reports of the amount of professional development training for using student achievement data they received in the year prior to spring 2007. Over one-third (43%) reported participating in from 1 to 8 hours of professional development for this purpose. Almost as many (39%), however, received none of this kind of professional development. At three of the schools, ID numbers 08, 26, and 39, over half of faculty reported receiving the training. Compared to schools 01 and 45 where about 16% of faculty received training, these three schools may be attempting to implement use of data across the school, rather than in pockets. This approach is more likely to

succeed in promoting greater use of data among faculty, according to some case study research (Light, Wexler, & Heinze, 2004).

Table F-2. Percent Reporting Professional Development for Using Achievement Data by Amount and by School

ID	None at all	1-8 hours	9-16 hours	More that 16 hours	Unsure
01	84.00	16.00			
03	13.50	46.20	21.20	9.60	3.80
08	24.10	58.60	6.90		10.30
14	18.50	40.70	11.10		3.70
26	23.10	69.20	7.70		
39	34.30	51.40	2.90	2.90	2.90
45	77.80	16.70		5.60	
47	41.40	41.40			10.30
48	41.70	45.80	4.20		
53	35.30	41.20	5.90	5.90	11.80
54	33.30	44.40		16.70	
Average	*38.82*	*42.87*	*8.56*	*8.14*	*7.13*

Interactions Related to Reading and Mathematics

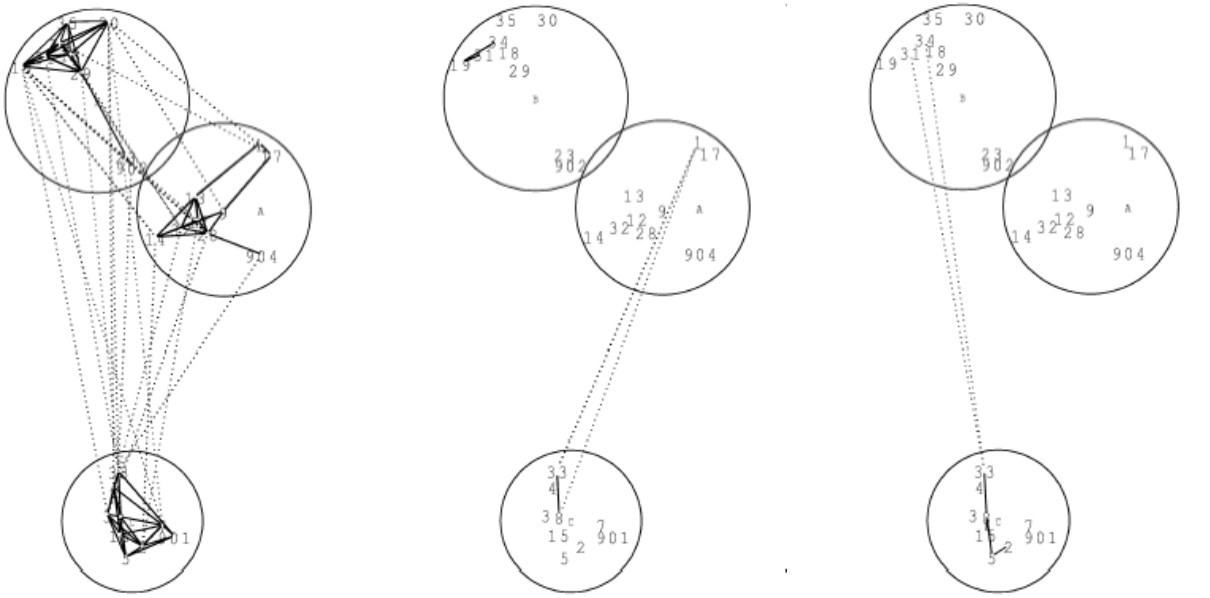
KEY FINDINGS:

- Relative to earlier reforms studied for schools in the sample, interactions concerning reading and math are less frequent.
- The differences in amount of help received for STAR testing for reading and math were not statistically different, although many of the interactions concerning reading and math were between the same teachers. Teachers received help from about 0.5 others for a total of about 36 days in the school year for each subject.

Under NCLB requirements, reaching targets for student achievement in reading and math is critical. Nonetheless, compared to interactions regarding reforms in place during our previous study (2003-06), interactions concerning reading and math were less frequent in the results of the 2007 faculty survey. On average, teachers in the previous study received help from 0.6 others concerning implementation of the reform in place at that time. In contrast, teachers in this study received help from 0.32 others in their efforts to increase STAR reading test scores and from 0.35 others to increase STAR math test scores. Thus, in sum, there is as much interaction concerning STAR testing for both reading and math as there was about the reform in the previous study. It is important to note that the differences could be a function of our instrument:

school rosters were used to elicit names concerning help with the reform whereas responses to help regarding the STAR test were based on free recall. Figure F-5 illustrates these differences rather dramatically. It depicts sociograms for one school, showing close collegial ties, interactions related to improving reading test scores, and interactions related to improving mathematics test scores.

Figure F-5. Sociograms Comparing Collegial Interactions with Interactions Related to Reading and Mathematics



Overall Collegial Ties **Ties Related to Reading** **Ties Related to Mathematics**

Influence of Collegial Ties and Past Reforms on Patterns of Interaction Related to NCLB

KEY FINDING:

- Past reforms and ties do influence patterns of help-seeking with respect to NCLB.

We modeled interaction regarding STAR mathematics results using characteristics of pairs of actors as a preliminary model. Results in the first school we analyzed indicated that interaction regarding STAR math was significantly predicted by whether two teachers were close colleagues in fall 2004, whether they helped one another concerning a schoolwide initiative in spring 2005, and the similarity with which they valued the schoolwide initiative in spring 2005. These results are consistent with our basic theoretical framework. They establish a direct interactional link between consecutive waves of reform as well as an indirect link through attitude formation. The results are intriguing because they potentially imply a consolidation of behaviors and interactions across reforms that can generate distinct sub-cultures and cliques within schools.

KEY FINDING:

- Perceived pressure to change is linked to receipt of federal funds. Teachers in the aggregate perceive less pressure when they teach in schools not receiving Title I funds.

Principals and teachers in more economically advantaged schools reported little to no influence of NCLB on their individual or organizational behavior, relative to schools that received Title I funding for serving low-income students (Table F-3). This lack of influence is not surprising, since the sanctions of NCLB apply only to Title I schools. Nonetheless, it is important because NCLB is part of a larger set of institutional forces related to accountability in education to which all schools are subject.

Table F-3. Percent Reporting Extensive Impact of NCLB on Aspects of Teaching Practice by School

SCHOOL ID	01*	03	08	14	26	39	45*	47*	48	53	54
Curriculum materials I use with students	4.35	82.61	30.77	40.91	44.00	28.13	6.67	27.27	14.29	11.76	35.29
Curricular activities I use with students		76.09	19.23	27.27	44.00	29.03	6.67	27.27	9.52	17.65	17.65
Content standards to which I teach		84.78	42.31	50.00	60.00	57.58	6.67	52.17	23.81	41.18	52.94
Number of topics I cover in a particular subject area		64.44	38.46	31.82	56.00	53.13	6.67	47.83	23.81	23.53	41.18
Levels of performance I expect from students		61.70	19.23	54.55	33.33	57.58		30.43	10.00	11.76	35.29
Complexity of assignments I give to students		52.17	7.69	42.86	32.00	18.75		26.09	4.76	17.65	23.53
Instructional strategies I use in class		65.22	23.08	38.10	12.00	37.50	6.67	17.39	9.52	23.53	5.88
Roles and responsibilities of students in learning		57.45	23.08	27.27	40.00	40.63	6.67	13.64	9.09	17.65	5.88
Classroom management strategies I use		36.96	15.38	33.33	17.39	28.13		4.35	9.52	5.88	
Ways I assess student learning	4.35	64.44	19.23	45.45	39.13	40.63		27.27	14.29	23.53	5.88
Ways students are organized for learning in class		52.17	11.54	36.36	20.00	46.88	6.67	21.74	9.09	35.29	5.88
Underlying beliefs that guide my teaching		28.26	7.69	45.45	16.00	25.00	6.67	30.43	4.76	5.88	
How I am assessed in my work as a teacher		71.74	30.77	31.82	48.00	19.35	6.67	30.43	14.29	35.29	11.76
How my pay is determined		17.39	3.85	4.55	8.00	6.06	6.67	4.35		5.88	5.88
How I document my work	4.35	52.17	19.23	27.27	40.00	18.18	6.67	17.39	9.09	11.76	11.76
AVERAGE	*4.35*	*57.84*	*20.77*	*35.80*	*33.99*	*33.77*	*6.67*	*25.20*	*11.85*	*19.22*	*19.91*

* School does not receive federal Title I funds.

KEY FINDING:

- Even though teachers do not distinguish NCLB from existing accountability-based reforms, teachers do distinguish subgroups for whom they believe NCLB requirements are more or less fair. In particular, teachers tend to view requirements for English Language Learners and for students with disabilities as less fair than for other students.

Figure F-6 shows teacher ratings of the fairness of NCLB student achievement targets for two groups of students. Less than 15% rated the 100 percent proficient by 2014 target as very unfair for Hispanic and Latino students compared with almost 35% rating the target as unfair for English Learners. These results indicate that teachers are concerned about English Learners meeting the achievement targets. They are less concerned about Hispanic and Latino students meeting the targets as not all of these students are English Learners.

Figure 7. Comparison of Ratings for NCLB Student Achievement Targets for Hispanic/Latino Students and English Learners Across Schools

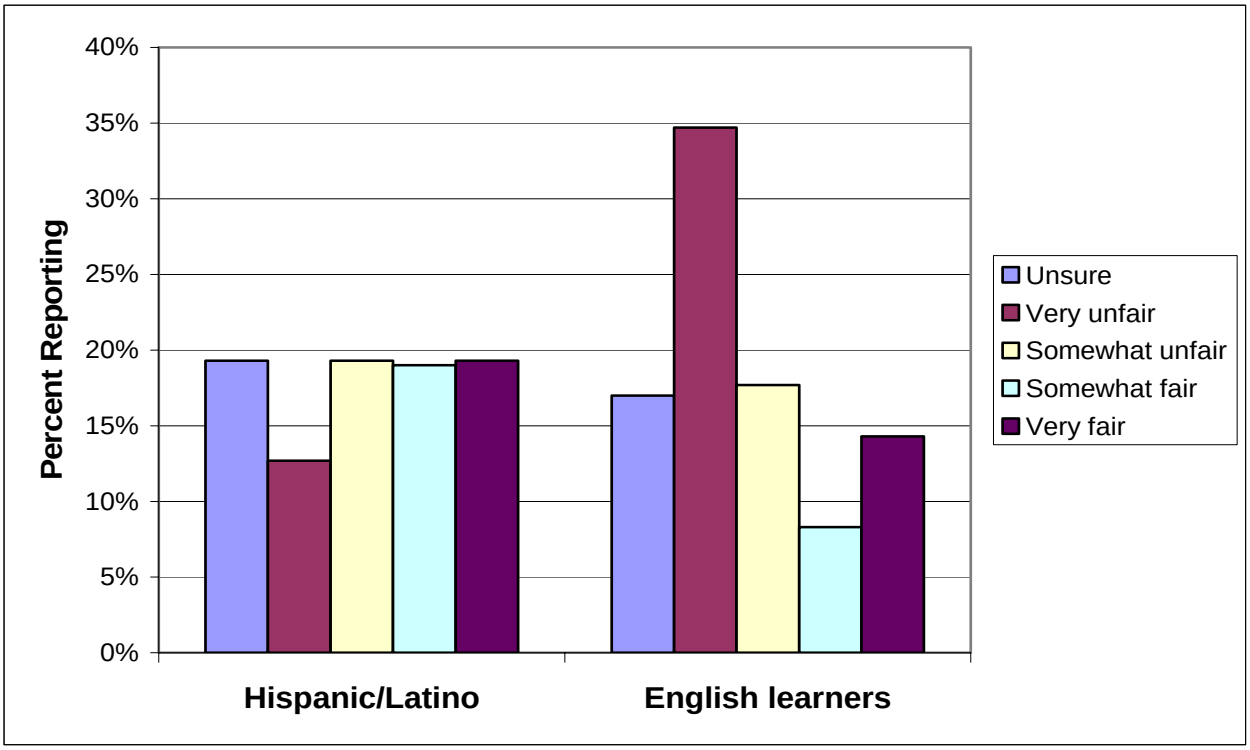
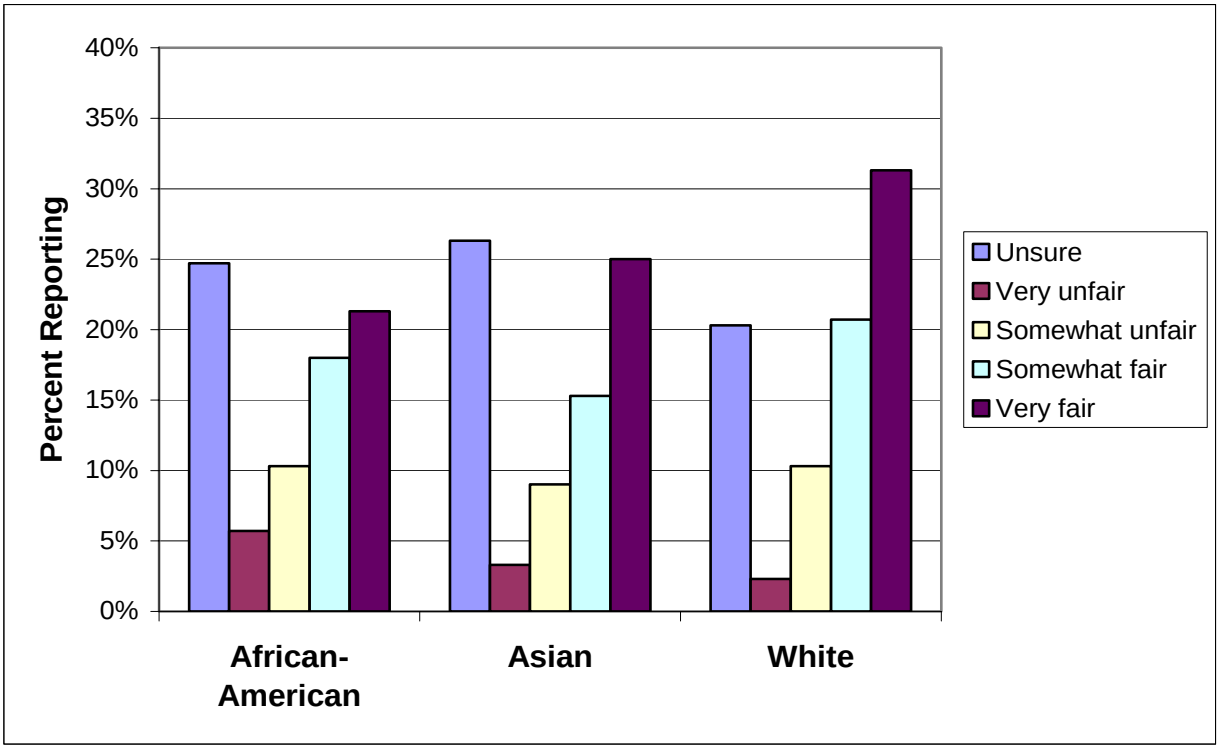


Figure F-7 shows ratings of the fairness of targets for three student subgroups. In comparison with Figure F-6, ratings for the three subgroups are more positive: over 30% rated the targets as very fair for white students, 25% as fair for Asian students, and over 20% for African-American students. These suggest that teachers differentiate among subgroups when it comes to NCLB

targets. Furthermore, the teachers in our sample reflect national discussions about NCLB reauthorization, which focus heavily on the need for accommodations for students with disabilities and for new policies regarding testing of English language learners.

Figure F-7. Comparison of Ratings for NCLB Student Achievement Targets for Three Student Subgroups Across Schools



Union Participation and Teachers' Attitudes

KEY FINDING:

- There is a disconnect between teachers' attitudes toward their local union organization and their attitudes toward the family of NCLB-related reforms. On the one hand, most teachers perceive there to be strong positive relationships between administrators and union representatives, but their attitudes toward some NCLB elements or proposed elements (e.g., merit pay for teachers), is consistent with national union opposition.

Much of the theory related to NCLB and teacher unions so far has focused on the macro-contexts of policy implementation. Some policy analysts (e.g., Moe, 2003) have predicted that unions may act to undercut NCLB, to the extent that reporting requirements make low achievement more visible to the public and sanctions on schools work against their institutionalized interests. New institutionalist theorists (e.g., DiMaggio & Powell, 1991) might

predict that local union organizations would adopt similar strategies to resist this external pressure in order to survive. Further, they might predict that norms contrary to leaders' efforts to improve schools might arise and be reinforced by subgroups within the school (see Nee & Ingram, 1998). However, none of these perspectives or predictions considers specifically how organizational responses might be modified and influenced by social processes and interactions within organizations.

Teachers' survey responses indicated that their attitudes toward NCLB's provisions are mixed. With respect to the central premise of NCLB, that schools should be held accountable for all students' achievement, 59 percent said that was either somewhat important or very important for improving schools. Just 13 percent of teachers believe merit pay for teachers (a proposed but not yet implemented provision of NCLB) is somewhat important or very important for improving schools.

To explain the disconnect between attitudes toward local unions and NCLB provisions, we propose that strong, positive relationships at the school level between union representatives and administrators can result in a more complex pattern of response to NCLB on the part of teachers than predicted by new institutionalist theory. Empirical research has shown that union representatives are well positioned to influence how teachers perceive and respond to changes originating in the policy environment NCLB (Gallagher & Strauss, 1991). Therefore, we conducted another analysis focused within schools on three measures: network position (union representative, regular union meeting attendee, others), attitudes about the likely effectiveness of core NCLB strategies (e.g., holding schools accountable for reducing achievement gaps), and a scale measuring the quality of union-administrative relationships in the school ($\alpha = 0.97$).

Results of the analysis show that although many teachers across the schools are skeptical of the value of some of the strategies of current and proposed versions of NCLB that might be predicted by new institutionalist theorists, their attitudes are unrelated to network position. Furthermore, faculty members who regularly attend union meetings have a slightly more favorable view of union-administrator relationships than those faculty members who do not attend ($p = .05$). Together, these findings suggest that teachers' attitudes may indeed be influenced by larger institutional conflict between union and administration, but that at the local level, teachers may still work toward their school's reform goals, buffeted by what they perceive to be positive relationships between unions and administrators.

These findings are consistent with past studies of public sector unions which have found that whether unions support or oppose innovations depends greatly on the tenor of relations been the school board, administrators, and faculty (Belman, 1992; Belman & Block, 2003). Where the parties have established a trust-based relationship that supports mutual problem-solving, unions can play a central role in informing faculty about issues, developing a consensus around those issues, and working with administrators in implementing innovations (Freeman, 2002; McKersie, Greenhalgh, & Jick, 1981).

Table F-4. Percent Reporting Importance of Reforms for Improving Student Achievement Across Schools

	Unsure	Not at all important	Not very important	Neutral	Somewhat important	Very important
Requiring schools to use research-based curriculum materials	7.00%	4.00%	5.00%	17.30%	29.70%	33.00%
Holding schools accountable for improving achievement of all subgroups at the school	6.00%	6.00%	7.30%	17.00%	28.70%	30.00%
Giving parents the choice to change schools if the school is failing	8.00%	9.70%	9.30%	30.00%	20.30%	19.00%
Giving parents the choice to purchase tutoring services with a school	11.70%	16.70%	17.00%	22.70%	17.00%	11.00%
Tying administrator (principal) contracts to achievement results	11.70%	26.30%	23.70%	15.30%	13.30%	5.70%
Giving merit pay to teachers on the basis of their students	9.00%	45.70%	15.00%	13.00%	8.00%	5.30%

Teacher Turnover and Collegial Networks

KEY FINDING:

- A key challenge in struggling schools is a high rate of teacher turnover. This reality creates practical problems for schools but also methodological ones for researchers studying network change because some aspects of network change need to be attributed to teacher turnover, not responses to institutional pressure.

Table F-5 presents a comparison of faculty who completed surveys in 2005 during our earlier study, and in 2007 during our current study. Approximately 35 percent of the people on our rosters in 2005 were not on our rosters in 2007, and approximately 28 percent of the people on our rosters in 2007 were not on our rosters in 2005. This suggests about a 33 percent turnover in 2 years.

Table F-5. Comparison of Faculty Survey Participants, 2005 and 2007

SCHOOL ID	NUMBER STAFF 2007	NUMBER STAFF 2005	BOTH SURVEYS	% BOTH SURVEYS	2007 SURVEY ONLY	2005 SURVEY ONLY	NO SURVEYS
01	31	28	23	74.2	2	3	5
03	63	65	27	42.9	24	22	12
08	38	34	20	52.6	9	11	8
14	89	79	6	6.7	21	28	21
26	29	30	20	69.0	5	7	5
39	48	44	27	56.3	8	6	17
45	25	20	9	36.0	9	9	5
47	33	31	15	45.5	14	13	4
48	31	26	16	51.6	11	8	4
53	27	21	13	48.1	4	4	13
54	23	17	13	56.5	5	3	4
Total	*437*	*395*	*189*	*49.0*	*112*	*114*	*98*

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