Principals' Views of Mathematics Standards, Frameworks, and Assessment in a Context of Reform

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PRINCIPALS' VIEWS OF MATHEMATICS STANDARDS, FRAMEWORKS, AND ASSESSMENT IN A CONTEXT OF REFORM

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Abstract

The purpose of this study was to gather information on principals' views regarding standards, frameworks, and assessment in mathematics. Based on surveys completed by 96 principals from 35 public school districts in Greater Los Angeles—each principal a past participant in events sponsored by the UCLA Principals' Center—our findings reflect the views of principals interested in improving educational practice. With regard to standards and frameworks, the findings indicate that the principals' schools were not currently building mathematics programs closely on existing standards and frameworks; however, these principals were prepared to support the future implementation of state and/or district mathematics standards in their schools, and they requested resources and assistance with implementation. The principals disagreed on the need for standards at the school level. With regard to testing, the principals were concerned that parents and students may not understand the results of norm-referenced tests and that norm-referenced tests are not aligned with their instructional programs in mathematics. The principals were likely to favor performance-based measures for program evaluation and reporting and for guiding instruction, and they requested resources and assistance for building teacher capacity with new assessments. However, a large minority of the principals favored the use of both forms of mathematics testing, and some principals favored norm-referenced testing. Thus, although these principals represented administrators engaged in school improvement, they differed in their views regarding accountability testing. The findings suggest that resolution among the views of administrators lies in the design of mathematics standards that embrace a breadth of knowledge and skill, together with the design of a coherent, standards-based assessment system that integrates multiple measures.

The purpose of the present study was to gather information on principals' views regarding standards, frameworks, and assessment in mathematics. In mathematics education, policies and practices have been in continual flux for well over a decade, and principals are facing challenges as they mediate between changes at the district, state, and national levels and mixed reactions to changing

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policies among teachers, parents, and students at their school sites. To understand the stance of principals toward the current policy context, we distributed a survey to principals in Greater Los Angeles in the spring of 1997 and analyzed principals' responses regarding:

- current use of existing standards and frameworks to guide mathematics instruction and assessment practices at their school sites;
- the future need for standards;
- stakeholders' understandings of results from norm-referenced tests (the prevailing method of accountability testing);
- the usefulness of norm-referenced versus performance-based testing for guiding instruction, for program evaluation, and for reporting.

Our findings are based on 96 surveys completed by K-12 principals from 35 districts in Greater Los Angeles. The findings shed light on the context for the planned implementation of statewide standards and assessments, and inform strategies for supporting implementation. Given the central role of principals in guiding implementation of standards and assessments at the school level, it is critical that we understand the content and range of their current views.

Background: The Policy Context

Assessment practices in mathematics education have been changing in today's schools in response to new mathematics education frameworks that call for pedagogies based upon student inquiry (California Department of Education, 1992; Mathematical Sciences Education Board, 1990a, 1990b, 1993; National Council of Teachers of Mathematics, 1989, 1991, 1993; Schoen, 1993). In addition to more traditional assessments such as computation quizzes and norm-referenced tests that measure competence with basic skills, new performance-based assessments involve lengthier and more reflective tasks designed to measure students' strategies for solving problems and their understandings of mathematical concepts and principles. The newer assessments represent possibilities for educational improvement, provided they are understood, utilized, and valued in similar ways.

In the state of California, policies and practices concerned with mathematics education and mathematics assessment have been contentiously debated over the last decade, a context that makes it very likely that stakeholders —including principals, our focus here—will differ in their views and understandings.

Consider the ways that diverse efforts to improve components of mathematics education—framework, standards, assessments—are currently underway in often uncoordinated arenas.

Assessment. Following the hallmark release of the *Mathematics Framework* (California State Department of Education, 1985, 1992), the California Learning Assessment System (CLAS) developed and implemented performance-based mathematics assessments designed to be aligned with the tenets and goals of the *Framework* (Merl, 1994). California Governor Wilson's veto of the bill reauthorizing continuation of the CLAS program in 1994 left the state without an assessment system. Despite 1995 legislation authorizing the design and implementation of a new system, continuing debates in the legislature and across the state have addressed such concerns as the role of standards versus frameworks as the basis for the new tests, the technical feasibility of equating district-selected tests for statewide comparisons, strategies for ensuring the validity and meaningfulness of individual student scores, and the advantages of available off-the-shelf tests versus customized tests. The statewide testing program in place at this time is voluntary; the program reimburses districts for testing students in Grades 2 through 12, provided that districts use tests on an approved list. Because there exist few published tests with a validated performance component, the voluntary testing program and its fiscal incentives encourage districts toward continued reliance on traditional, standardized testing.

Framework. To address public concern about relatively low levels of student achievement on various measures, including the first CLAS administration and the National Assessment of Educational Progress (NAEP), California State Superintendent of Instruction Delaine Eastin appointed a task force to make recommendations for mathematics education based on research evidence. A key recommendation of the task force was greater attention to basic skills without sacrificing the framework's focus on application, concepts, inquiry, and problem solving.

In response to the task force report, a committee was created to revise the *Mathematics Framework*. No draft had been released at the time of our study. The decision to revise the framework provided schools with grounds for delaying adoption and implementation of new curriculum aligned with the 1992 *Framework*.

Standards. At the time of the study, draft standards were being developed by two different groups. First, as part of the state Department of Education's "Challenge School District Reform Initiative," a program to jumpstart the design and implementation of standards-based education in a sampling of school districts across the state, the California Education Round Table constructed a set of draft standards in all curriculum areas proposed as the basis for the new state assessment system; these standards were released in draft form in December 1995. Second, Governor Wilson appointed a separate commission to establish state standards; no draft has yet been released. While both of these groups were working on standards, many school districts were engaged independently in developing and implementing standards and assessments to comply with federal legislation requiring a standards-based system to track student achievement.

Thus at the time of this study, the state had no framework, no final set of standards, and no mandated statewide testing program. In this context of continuing debate and yet-to-be-implemented policies concerning standards, framework, and assessments, principals must certainly have been challenged in their roles as instructional leaders. Principals were likely to differ in their views, understandings, and roles vis-à-vis mathematics standards and assessment in their schools.

Principals' Views

Principals' views of standards, frameworks, and assessments may impact the utility and validity of large-scale assessments, at least in the initial stages of implementation. For example, if principals disagree about the utility of an assessment—its role in guiding instructional improvement—they may differ in the kinds of resources and guidance they provide their teaching staffs. Resulting differences in students' opportunities to prepare for and/or engage with a particular form of assessment will contribute to inequities that will, in turn, weaken the validity of an assessment: When students are not prepared for an assessment in comparable ways, or when an assessment is not administered, scored, reported, or interpreted in comparable ways, we must question whether the assessment reflects student competence. As another example, if principals disagree about the validity of various measures of students' mathematics achievement, they will make different choices of instruments when designing strategies for program evaluation, weakening possibilities for school comparisons.

In the current context of unstable policy, there is potential for misalignment among principals' beliefs regarding the validity and usefulness of any potential indicator of student performance. Mathematics assessments and the standards and frameworks that serve as their basis have become more diverse in form and purpose, and debates regarding assessments continue unresolved. However, very little is known about principals' views of mathematics assessment. One study suggests that principals are likely to be supportive of performance assessment: Koretz, Mitchell, Barron, and Keith (1996) reported fairly broad support among a sampling of Maryland principals for the new Maryland School Performance Assessment Program. Many principals reported encouraging teachers to work toward aligning curriculum and instruction with the new assessments. Nelson (1997) documented marked differences among principals' philosophies of mathematics education and the ways that principals' views influenced their roles in improving instruction at their schools. Outside of this study, there has been little investigation of the role of principals in the implementation of mathematics standards, frameworks, or assessments.

The literature on teachers suggests how principals—as instructional leaders—may interpret new mathematics standards and assessments. Research has shown that teachers are likely to differ in their understandings and uses of new mathematics assessments (Brookhart, 1994; Cizek, Rachor, & Fitzgerald, 1995; Druker & Shavelson, 1995; Manke & Lloyd, 1990; Plake, Impara, & Fager, 1993; Reeve, 1995; Saxe, Franke, Gearhart, Howard, & Crockett, 1997; Stecher & Mitchell, 1995; Terwilliger, 1989; Torrance & Pryor, 1995) and new mathematics frameworks, curriculum, and pedagogy (e.g., Cohen & Ball, 1990; Cohen et al., 1990; Fennema & Franke, 1992; National Center for Research on Teacher Education, 1991; Pajares, 1992; Prawat, 1992; Schifter & Simon, 1992; Thompson, 1992). Comparable studies of principals are needed. Although the importance of principals' knowledge of curriculum, pedagogy, and assessment has been broadly emphasized in the literature (e.g., Burrello, 1992; Cooper, 1989; Dwyer, 1986; Foley, 1993; Foriska, 1994; Hayden, 1990; Niece, 1993; Pravica & McLean, 1983; Reitzug & Burrello, 1995; Thomson, 1993; Wallman, 1991), we need greater understandings of principals' interpretations of the utility and validity of mathematics assessments and the standards and frameworks that serve as their basis.

Purpose of Study

The purpose of the present study was to provide contextual information to inform districtwide and/or statewide implementation of mathematics standards and assessments. Our study addressed principals' views regarding current use of existing standards and frameworks, the future need for standards, stakeholders' understandings of results from norm-referenced tests, and the usefulness of norm-referenced versus performance-based testing for various purposes. Our study was set in Greater Los Angeles, in a context of evolving state efforts to reform mathematics education and state-level assessment, and, for some principals, additional district or school-level efforts to reform their assessment systems. Findings are based on a survey completed by 96 public school principals from 35 school districts that varied in district size, student need, and student ethnicity.

Method

Participants

A survey was mailed to all principals who had previously attended one or more events sponsored by the UCLA Principals' Center. This sample of principals shared in common their prior voluntary participation in Principals' Center events, a likely indicator of their interest in improving educational practice. Table 1 contains the distribution of surveys mailed and those returned. To focus on policy issues in public schools, we eliminated the eight private schools from our analyses. The two public elementary/middle schools were incorporated in the category for elementary schools.

The principals in our sample were responsible for the administration of schools that varied in location, level, district size, student need, and student ethnicity. Thirty of the 35 districts were located in the "urban fringe" in Greater Los Angeles (NCES definition: "any incorporated place, Census Designated Place, or non-place territory within a CMSA or MSA of a Mid-size City and defined as urban by the Census Bureau," Quality Education Data, 1997). Of the remaining five districts, two were considered "large city" (central area of a city greater than 250,000), one "mid size city" (central area of a city less than 250,000), and one "urban fringe of a mid-size city." The districts varied markedly in size, Title I expenditure per pupil, proportion of students qualifying for free lunch, and

Table 1

Survey Distribution and Returns

Level	No. of public districts		No. of public schools		No. of private schools	
	Sent	Returned	Sent	Returned	Sent	Returned
Elementary	49	27	253	69	8	4
Elementary/Middle	1	1	3	2	2	1
Elementary/High	0	0	0	0	2	1
Middle	25	7	60	15	0	0
Middle/High	1	0	1	0	1	1
High	24	8	41	10	1	1
TOTAL	62	35	358	96	14	8

student ethnicity (Table 2); note the high values of the standard deviations relative to the means in each category, as well as the great range in values in each category.

Table 2

Sample Characteristics for One Large District vs. All Other Districts (N = 34): District Size, Student Need, and Student Ethnicity

	Indices of district size			Indices of student need		Student ethnicity (Proportion of students)			
	# Schools	# Students	# Teachers	Title I expend. per pupil	Free lunch (Proportion of students)	White %	African Amer %	Hisp Amer %	Asian Amer %
Large district	774	645,341	29,424	$205	.70	.12	.14	.66	.14
Other districts (N = 34)									
Mean	18.5	14,856	644	$112	.40	.35	.08	.42	.13
SD	14.5	13,814	616	$80	.24	.26	.10	.26	.12
Range	4-84	2,190-79,234	106-3,587	$0-$280	2-80	.00-.84	.01-.44	.04-.93	.01-.48

Survey

Our survey is contained in the Appendix. The survey content and format were informed by what we learned from 11 principals who volunteered to participate in a 4-hour focus group on mathematics standards and assessment. Principals' responses on most topics were captured with Likert items (either "extent of use" or "disagree/agree" on a scale of 1 to 5). Principals also responded to open-ended items on mathematics standards and frameworks, mathematics assessment, and possible topics for a Principals' Center summer institute.

Evidence of Validity of the Survey Constructs

Our goal was to document patterns of consensus or conflict, and therefore we focused our analyses of the Likert items on patterns of agreement versus disagreement by collapsing the two levels of disagreement (1 and 2) and the two levels of agreement (4 and 5) on our scale. A principal components analysis on these data resulted in a 5-component (varimax rotated) solution explaining 60.4% of the total variance of the items. The scales were readily interpretable and provided evidence of validity for the survey constructs. The first component represented principals' views of the usefulness of norm-referenced tests; the second component represented principals' views of the usefulness of performance-based tests. Cronbach's alpha for the items loading on each of these two components was .85 and .83 respectively. The third component represented principals' reports of their school's use of standards and frameworks; items loading on this component had a Cronbach's alpha of .77. The fourth and fifth components represented principals' views of stakeholders' understandings of norm-referenced test results and principals' views of the need for standards. Items loading on each of these components had Cronbach's alphas of .84 and .68 respectively. Thus, five components explained a good amount of the total variance (60.4%), and the reliability of the principal components ranged from acceptable (.68) to good (.85). Items that did not load on any principal component were excluded from further analysis.

Analysis

Results are reported as comparisons between elementary versus secondary principals by (a) means for items loading on each principal component and (b) means for each item. Although the number of secondary principals was low, we

believed the descriptive purpose of this study merited an exploration of differences in the views of principals by level.

We chose to report means of all items loading on each component—rather than principal component scores—based on our finding that the pattern of comparisons for elementary versus secondary principals was the same for principal component scores and means. Means are more readily interpretable indicators. In making our decision, we first computed principal component regression scores; because of missing data, listwise deletion reduced the number of subjects to $N = 47$. To produce scores with less loss of information, we then computed component scores separately from five 1-factor principal component analyses; the *N*s for each component score, in order, were 67, 89, 72, 92, and 87; because the same items were used, Cronbach's alphas were the same as reported above. A third method was to compute mean item scores on the subscales. No comparisons using any of these three measures produced evidence of significant differences between elementary versus secondary principals.

Qualitative analysis of the principals' comments entailed successive reduction and clustering of topics and issues. Because principals' responses often overlapped across open-ended items, all comments were combined in one analysis, and the unit of analysis was each principal—that is, each principal was coded once for the presence or absence of commentary on a given issue.

Results

The results are organized in two sections. In the first section, we report evidence of the principals' views on mathematics standards and frameworks. In the second section, we report evidence of their views on mathematics assessments used for accountability purposes.

Standards and Frameworks: Principals' Views of Existing Uses and Future Needs

In this section, we examine principals' reports of current use of standards and frameworks at their schools as well as principals' views of the future need for standards and for help with implementation of standards.

Extent of current use of standards and frameworks at school sites. The findings for principals' reported use of standards and frameworks at their schools suggest low to moderate implementation of these documents. The mean of the

items loading on the component Principals' Reports of Their Schools' Use of Standards and Frameworks for elementary principals was 2.42 (SD = 1.25, N = 51), and for secondary principals, 3.02 (SD = 1.22, N = 16); note that "3" represented "some use" on a 5-point scale (1 = *little*, 3 = *some*, 5 = *extensively*). The individual item results for the items loading on this component are contained in Table 3. Principals' reported uses of standards and frameworks varied greatly. Secondary principals were more likely to report relatively greater use of three documents: National Council of Teachers of Mathematics (NCTM) *Content Standards*, California's *Mathematics Framework*, and local standards developed at the school site. The California *Mathematics Framework* (1992) was reported to be in "some" use by most principals; ratings of "some" or greater use (ratings of 3, 4, or 5) were reported by 93% of elementary principals and 100% of secondary principals. Overall, the pattern of findings suggests that many of the principals' schools were not building their programs closely on many existing documents.

Table 3

Principals' Reports of the Extent of Use of Standards and Frameworks at Their Schools: Means and Standard Deviations for Elementary vs. Secondary Principals

Document	Elementary	Secondary
NCTM *Content Standards*		
M	1.92	3.37*
SD	1.80	1.38
n	60	19
California *Mathematics Framework*		
M	3.36	4.08*
SD	1.44	.89
n	67	24
State *Challenge Standards (draft)* for math		
M	2.18	2.22
SD	1.86	1.80
n	62	18
District standards for math		
M	3.05	2.96
SD	1.64	1.77
n	66	23
Math standards developed at your school		
M	1.96	2.86*
SD	1.93	1.78
n	62	22

Note. 1 = little, 3 = some, 5 = extensively.

*$p < .05$.

Given the flux of California policy in mathematics education, this pattern is not surprising.

Recommended levels for standards development and implementation. The findings suggested greater potential for consensus among principals on the role of standards at district and state levels, and greater potential for controversy on the role of standards at the school level. Overall, the mean of the items loading on the component Principals' Views of the Need for Standards for elementary principals was .53 (SD = .54, N = 65), and for secondary principals, .58 (SD = .54, N = 22), where -1 represented disagreement, 0 neutrality, and 1 agreement on statements regarding the need for standards. Thus the component results suggest moderate agreement on the need for standards. However, the individual item results indicate that principals' views differed depending on which system level was the focus (Table 4). Principals were likely to recommend that future standards be developed at state and district levels, but they were divided in their views concerning the need for standards at the local level. Indeed, few principals were neutral on the issue of local standards: 53% of elementary principals agreed that local standards will be needed, whereas 35% disagreed (12% neutral); 54% of secondary principals agreed, and 42% disagreed (4% neutral).

Table 4

Principals' Views of the Need for Mathematics Standards: Means and Standard Deviations for Elementary vs. Secondary Principals

Level	Elementary	Secondary
State level		
M	.78	.91*
SD	.54	.42
n	69	23
District level		
M	.68	.79
SD	.64	.59
n	66	24
School level		
M	.15	.09
SD	.94	1.00
n	65	23

Note. Responses were recoded to reflect disagreement, neutrality, or agreement (-1, 0, +1).

*$p < .05$.

Principals' comments on mathematics standards and frameworks. A majority of principals (80%) commented on mathematics standards and frameworks, and most focused on the need to build teacher capacity for implementation (Table 5). Principals requested resources—sometimes asking simply for copies of source documents (copies of standards, frameworks), at other times asking for curriculum resources aligned with standards; they also asked for help with professional development strategies, organizational restructuring (to permit more time, collegial involvement, etc.), and methods for standards-based evaluation of teaching. Some principals (35%) raised concerns about alignment—either alignment among components of practice (e.g., standards, curriculum, and assessment) or alignment across levels of the system (local, district, state, national). A few principals (13%) expressed concern about the need for parent education.

Summary. The principals were prepared to support the future implementation of state and/or district mathematics standards in their schools, though their schools were not currently building mathematics programs closely on existing standards and frameworks. They were not in agreement on the need

Table 5

Principals' Comments Regarding Mathematics Standards and Frameworks (N = 103)

Topic	Percent of respondents	Issues in order of frequency within each category
Standards and frameworks	80	Concerns about how to build teacher capacity for implementation Recommendations for content (e.g., concepts, skills, or a balance) Concerns about understandability, usability, and measurability
Alignment	35	Questions about alignment of standards with math framework; concerns about alignment of curriculum, instruction, and assessment Concerns about alignment across system levels (local, district, state, nation)
Parent education needed	13	Need to educate parents regarding standards Need to educate parents regarding assessment

for standards at the school level. These principals appeared ready to align their school programs with a set of mathematics standards, and they requested resources and assistance with implementation.

Accountability Testing: Principals' Views

In this section, we examine principals' perceptions of stakeholders' understandings of the prevailing form of testing (norm-referenced tests), their views of the current alignment of tests with their instructional programs, and their views of the usefulness of norm-referenced and performance-based testing for various purposes.

Principals' views of stakeholders' understandings of results from norm-referenced mathematics tests. Principals were not likely to agree that stakeholders understand the results of the currently prevailing form of accountability testing. The mean of the items loading on the component Principals' Reports of Stakeholders' Understandings of Norm-Referenced Test Results for elementary principals was -.32 (SD = .66, N = 70), and for secondary principals, -.35 (SD = .49, N = 22). The individual item results for the items loading on this component are contained in Table 6. The results differed depending on which stakeholder group was the focus; the principals were particularly concerned about the understandings of parents and students.

Table 6

Principals' Views of Stakeholders' Understandings of Norm-Referenced Test Results: Means and Standard Deviations for Elementary vs. Secondary Principals

Stakeholders	Elementary (N = 70)	Secondary (N = 22)
Teachers		
M	.15	.36
SD	.98	.79
Parents		
M	-.43	-.64
SD	.79	.66
Students		
M	-.63	-.77
SD	.64	.53

Note. Responses were recoded to reflect disagreement, neutrality, or agreement (-1, 0, +1).

Usefulness of norm-referenced versus performance-based tests. The principals differed in their views of the usefulness of norm-referenced tests, but they were likely to hold positive views of the usefulness of performance-based tests. The mean of the items loading on the component Principals' Views of the Usefulness of Norm-Referenced Tests for elementary principals was -.15 (SD = .65, N = 67), and for secondary principals, -.07 (SD = .49, N = 22), showing the principals' views to be slightly negative, but with substantial variation. The mean of the items loading on the component Principals' Views of the Usefulness of Performance-Based Tests for elementary principals was .72 (SD = .36, N = 56), and for secondary principals, .77 (SD = .28, N = 16). The individual item results for the items loading on these components (Table 7) are consistent with the overall means across items.

To provide evidence of principals' views of the *relative* usefulness of norm-referenced versus performance-based testing for various purposes, we next compared principals' responses to pairs of parallel items, one concerned with norm-referenced tests and other with performance tests. We "crossed" principals' responses to create a scale: *strongly prefer norm-referenced tests* = agree NRT, disagree PBT; *prefer norm-referenced tests* = agree NRT, neutral PBT; *neutral* = neutral on both items; *balance* = agree on both items; *prefer performance tests* = neutral NRT, agree PBT; *strongly prefer performance tests* = disagree NRT, agree PBT. The results indicated that the principals in our sample held views that ranged from support for both forms of testing to preference for performance-based testing. Below we report the results for clusters of items—program evaluation and reporting, and guiding instruction.

Program evaluation and reporting. One pair of items addressed program evaluation ("Results from norm-referenced/performance-based tests enable me to evaluate the effectiveness of the math program"). A second pair of items concerned communication of program effectiveness with parents and the community ("Results from norm-referenced/performance-based math tests enable me to inform the parents and the community about the effectiveness of the math program"). Table 8 contains these results. The pattern shows that a majority of the principals in our sample value performance-based testing for evaluation and reporting (the two PBT columns); a few principals endorsed only norm-referenced tests (the two NRT columns). However, a substantial

Table 7

Principals' Views of the Usefulness of Norm-Referenced and Performance-Based Testing

Item			Elementary	Secondary
Results from _____ math tests enable me to evaluate the effectiveness of the math program.	norm-referenced	*M*	-.09	-.05
		SD	.87	.78
		N	69	22
	performance-based	*M*	.73	.94*
		SD	.51	.24
		N	66	18
Results from _____ math tests enable math teachers to make sound instructional decisions.	norm-referenced	*M*	-.09	-.14
		SD	.84	.83
		N	68	22
	performance-based	*M*	.75	.83
		SD	.50	.51
		N	64	18
Results from _____ math tests enable me to inform the parents and the community about the effectiveness of the math program.	norm-referenced	*M*	-.19	-.05*
		SD	.88	.79
		N	69	22
	performance-based	*M*	.67	.76
		SD	.60	.56
		N	63	17
The content and format of _____ math tests provide a good model for math instruction.	norm-referenced	*M*	-.19	-.17
		SD	.86	.89
		N	69	23
	performance-based	*M*	.72	.89*
		SD	.57	.32
		N	65	18
The content of _____ math tests matches the content of the math program we are utilizing.	norm-referenced	*M*	-.17	.17
		SD	.89	.83
		N	69	23
	performance-based	*M*	.49	.29
		SD	.73	.85
		N	59	17
I welcome district _____ math tests that encourage more attention to basic math skills.	norm-referenced	*M*	-.16	-.17
		SD	.83	.83
		N	69	23
	performance-based	*M*	.91	.94
		SD	.34	.24
		N	67	18

Note. 1 = little, 3 = some, 5 = extensively. *$p < .05$.

Table 8

Percentage of Principals by Their Views of the Value of Testing for Program Evaluation and Reporting

	N	Strongly prefer NRT	Prefer NRT	Neutral on both	Balance: Prefer both	Prefer PBT	Strongly prefer PBT
Program evaluation							
Elementary	55	2	6	9	27	18	38
Secondary	18	0	0	11	33	28	28
Reporting							
Elementary	52	0	4	13	27	12	44
Secondary	17	0	0	18	29	24	29

Note. NRT Strong = agree NRT, disagree PBT; NRT Weak = agree NRT, neutral PBT; Neutral = neutral on both items; Balance = agree on both items; PBT Weak = neutral NRT, agree PBT; PBT Strong = disagree NRT, agree PBT.

percentage of principals were classified as either "neutral" or "balanced" in their views (from 38% to 47%, combining *neutral on both* with *balance/prefer both*).

Guiding instruction. Three pairs of items captured principals' views regarding the ways that tests encourage attention to important curriculum ("I welcome district or state norm-referenced/performance-based tests that encourage more inquiry and problem solving"), provide a good model for mathematics instruction ("The content and format of norm-referenced/performance-based math tests provide a good model for math instruction"), and provide a basis for sound instructional decisions ("Results from norm-referenced/performance-based tests enable math teachers to make sound instructional decisions"). The results in Table 9 indicate that a majority of the principals in our sample valued performance-based testing for guiding instruction (the two PBT columns), a few principals endorsed only norm-referenced tests (the two NRT columns), and a substantial percentage of principals were classified as either "neutral" or "balanced" in their views (from 26% to 38%, combining *neutral on both* with *balance/prefer both*). Thus most of the principals in our sample held views that ranged from support for both forms of testing for guiding instruction to preference for performance-based testing.

Table 9

Principals' Views of the Role of Tests in Guiding Instruction

	N	Strongly prefer NRT	Prefer NRT	Neutral on both	Balance: Prefer both	Prefer PBT	Strongly prefer PBT
Encourage attention to important curriculum							
Elementary	61	0	3	2	25	26	44
Secondary	19	0	5	5	26	21	47
Good model for math instruction							
Elementary	49	0	4	0	26	22	47
Secondary	17	0	0	0	38	25	56
Basis for sound instructional decisions							
Elementary	53	0	6	0	30	25	40
Secondary	17	0	6	0	29	24	41

Note. NRT Strong = agree NRT, disagree PBT; NRT Weak = agree NRT, neutral PBT; Neutral = neutral on both items; Balance = agree on both items; PBT Weak = neutral NRT, agree PBT; PBT Strong = disagree NRT, agree PBT.

Principals' comments on mathematics assessment. Consistent with comments on standards and frameworks, the comments offered by 60% of the principals on assessment focused most often on their concerns with teacher capacity (Table 10). Principals requested information (e.g., copies of tests used for accountability) and recommendations for assessments that allow schools to track students' progress toward achievement of standards. Principals also asked for help with professional development and organizational restructuring strategies that enable teachers to build the capacity to utilize new forms of assessment effectively. (Already reported in Table 5 were comments on the needs for alignment of standards and assessment and for parent education on new assessments.)

Table 10

Principals' Comments Regarding Assessment (N = 103)

Topic	Percent of respondents	Issues in order of frequency
Assessment	60	Concerns about building teacher capacity for classroom assessment and practices aligned with large-scale assessments Recommendations regarding assessment system—a balance of norm-referenced and performance-based tests Desire for performance tests Timing issues—faster turn around; fall testing

Summary. The principals in our sample were concerned that parents and students may misunderstand the results of NRTs and that NRTs are not aligned with their instructional programs in mathematics; they felt that performance-based measures are needed for program evaluation and reporting and for guiding instruction, and they requested resources and assistance for building teacher capacity with new assessments. In the context of this pattern of results, it is important to note that a large minority of these principals favored the use of both norm-referenced and performance-based mathematics testing.

Summary and Discussion

The purpose of this study was to gather information on the views of principals regarding the usefulness of existing standards and frameworks for guiding instructional practice, and the usefulness of norm-referenced versus performance-based testing for program evaluation, reporting, and guiding instruction. Surveys were completed by 96 principals from 35 school districts that varied in district size, student need, and student ethnicity. Each principal was a past participant in events sponsored by the UCLA Principals' Center, and thus our findings reflect the views of principals possibly more invested in improving educational practice than a random sampling of principals. The study was descriptive in purpose to supplement the little that is known about principals' views of current or impending policies in mathematics education. This is a critical gap in our understanding, given principals' importance as

leaders and facilitators in the implementation of new policies in schools and classrooms. It is time we take stock, particularly in the state of California, where mathematics frameworks, standards, and assessments have been in continual flux for well over a decade.

The principals in our sample were prepared to support the future implementation of state and/or district mathematics standards in their schools, though their schools were not currently building mathematics programs closely on existing standards and frameworks. These findings make sense in the shifting policy context in California—these principals were expressing their readiness for consensus and commitment. They appeared ready to align their school programs with a set of mathematics standards, and requested assistance with strategies for building teacher capacity at their schools.

The principals had concerns about the role of norm-referenced mathematics tests—the currently prevailing form of accountability testing—and were generally supportive of the potential role of performance-based measures in accountability testing. Many principals were concerned that parents and students may not understand the results of NRTs, and some principals were concerned that NRTs are not aligned with their instructional programs in mathematics. Many principals felt that performance-based measures are needed for program evaluation, for reporting, and for guiding instruction, and they requested resources and assistance for building teacher capacity with new assessments. Such was the overall pattern of our results, but it is important to note that a large minority of the principals in our sample favored the use of both norm-referenced and performance-based mathematics testing, and a few principals favored norm-referenced testing.

The constituencies who have been responsible for developing state and district content standards and performance assessments for measuring student learning should be heartened by our results. The results demonstrate the commitment of many school administrators to incorporating new educational practices grounded in new views of what students should know and be able to do in mathematics. At the same time, many of the principals in our sample were not advocating that standards, frameworks, and assessments step completely away from traditional mathematics. Principals' views ranged from 'center of the road' to greater interest in new practices, with a few principals holding to norm-referenced testing and a focus on basic skills.

These differences need to be resolved among administrators as well as within state committees, to permit a unified view that all can support, one that will encourage equitable implementation across schools. Individual principals are likely to differ in their response to the documents that emerge from committee consensus, and differences among principals' views of mathematics standards and assessments will of course influence their support for implementation at the local school sites. Our findings for the future implementation of new standards and performance assessment in mathematics are hopeful. While we grant that these principals may represent a group that is interested in change, it is still noteworthy that the majority of these principals expressed support for standards and new methods of assessment. It is also noteworthy that these principals disagreed regarding the relative roles of norm-referenced versus performance assessment. These results suggest that a resolution lies in the design of standards that embrace a breadth of mathematics knowledge and skill, together with the design of a coherent standards-based assessment system that integrates multiple measures.

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APPENDIX

Survey

Name _____

District _____

School _____

Level _____

PART I. YOUR VIEWS ON STANDARDS

1. Is your school utilizing <u>standards or frameworks</u> to guide decisions about math curriculum, instruction, or assessment? If yes, to what extent?

Sources	*Used?*		If Yes: To what extent does this source guide decisions?				
			Little		Some		Extensively
a. Math standards developed at your school	*Don't Know*	***Yes No***	1	2	3	4	5
b. Your district's standards for math	*Don't Know*	***Yes No***	1	2	3	4	5
c. State Challenge Standards for math	*Don't Know*	***Yes No***	1	2	3	4	5
d. California Mathematics Framework	*Don't Know*	***Yes No***	1	2	3	4	5
e. NCTM (National Council of Teachers of Mathematics) Content Standards	*Don't Know*	***Yes No***	1	2	3	4	5
f. Other math standards _____	*Don't Know*	***Yes No***	1	2	3	4	5

2. What are <u>your views of standards for mathematics</u>?

Views	To what extent does the statement reflect your views?					
	Don't Know	Strongly Disagree		Neutral		Strongly Agree
a. Math standards should be developed at the national level.	*D/K*	1	2	3	4	5
b. Math standards should be developed at the state level.	*D/K*	1	2	3	4	5
c. Math standards should be developed at the district level.	*D/K*	1	2	3	4	5
d. Math standards should be adapted or developed at each school, to reflect the needs of the students.	*D/K*	1	2	3	4	5

3. What are <u>3 burning issues regarding standards and frameworks in ANY subject area</u> that concern you as a principal?

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PART II. YOUR VIEWS ON ASSESSMENT

4. Does your district include <u>norm-referenced math achievement tests</u> as part of its testing program?

Yes No **<u>If yes</u>: What test(s)** _____

<u>If yes</u>: Does your school routinely participate? Yes No

5. What are your views of <u>district-level norm-referenced math testing</u>?

Views of district norm-referenced math testing	**To what extent does the statement reflect your views?**				
	Strongly Disagree		**Neutral**		**Strongly Agree**
<u>Assessment and instruction</u>					
a. The content of norm-referenced math tests matches the content of the math program we are utilizing.	1	2	3	4	5
b. The content and format of norm-referenced math tests provide a good model for math instruction.	1	2	3	4	5
c. Results from norm-referenced math tests enable math teachers to make sound instructional decisions.	1	2	3	4	5
d. I welcome district norm-referenced math tests that encourage more attention to basic math skills.	1	2	3	4	5
e. I appreciate the need for some norm-referenced math tests, but I do not want results from that component over-emphasized.	1	2	3	4	5
f. I am committed to an inquiry approach to math instruction, and norm-referenced math tests conflict with my goals for an instructional program.	1	2	3	4	5
<u>Understanding</u>					
a. I understand the results of norm-referenced math tests.	1	2	3	4	5
b. Teachers understand the results of norm-referenced math tests.	1	2	3	4	5
c. Parents understand the results of norm-referenced math tests.	1	2	3	4	5
d. Students understand the results of norm-referenced math tests.	1	2	3	4	5
<u>Program evaluation</u>					
a. Results from norm-referenced math tests enable me to evaluate the effectiveness of the math program.	1	2	3	4	5
b. Results from norm-referenced math tests enable me to inform the parents and the community about the effectiveness of the math program.	1	2	3	4	5

6. Does your district include performance-based testing in math as part of its testing program?

Yes No **<u>If yes</u>: What test(s)** _____

<u>If yes</u>: Does your school routinely participate? Yes No

7. What are your views of performance-based testing in math at either the district or the state level? Please answer even if you haven't had experience with district or state level performance testing.

Views of performance-based math tests at the state or district level	**To what extent does the statement reflect your views?**				
	Strongly Disagree		**Neutral**		**Strongly Agree**
<u>Assessment and instruction</u>					
a. The content of performance-based tests matches the content of the math program we are utilizing.	1	2	3	4	5
b. The content and format of performance-based tests provide a good model for math instruction.	1	2	3	4	5
c. Results from performance-based tests enable math teachers to make sound instructional decisions.	1	2	3	4	5
d. I welcome district or state performance-based tests that encourage more inquiry and problem solving.	1	2	3	4	5
e. I appreciate the need for some performance-based tests, but I do not want results from that component over-emphasized.	1	2	3	4	5
f. I am committed to a NRT approach to math instruction, and performance-based tests conflict with my goals for an instructional program.	1	2	3	4	5
<u>Program evaluation</u>	1	2	3	4	5
a. Results from performance-based tests enable me to evaluate the effectiveness of the math program.					
b. Results from performance-based tests enable me to inform the parents and the community about the effectiveness of the math program.	1	2	3	4	5

8. <u>Math assessment wish list</u>: Make 3 recommendations to district or state testing offices.

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PART III. YOUR RECOMMENDATIONS FOR THE INSTITUTE

9. What topics and issues would you like to see addressed in the <u>institute</u>? In what subject areas?

Possible topics	Subject areas	Issues you would like addressed
Standards & Frameworks	__Math __Language Arts __Science __History/Social Science __Other _____	
Classroom assessment	__Math __Language Arts __Science __History/Social Science __Other _____	
Report card grades	__Math __Language Arts __Science __History/Social Science __Other _____	
District norm-referenced testing	__Math __Language Arts __Science __History/Social Science __Other _____	
District (or state. performance-based testing	__Math __Language Arts __Science __History/Social Science __Other _____	
National testing	__Math __Language Arts	
Other (please explain)		