

Formal and Informal Mentoring in the First Year of Teaching

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Abstract

Relatively little is known about the characteristics of teacher mentoring and induction experiences that are associated with improvement in instruction and student achievement. This paper takes an initial step toward understanding the role that formal and informal mentors play in new teacher induction by exploring the content and perceived helpfulness of beginning middle school math teachers' interactions with their mentors. We examine whether the content and helpfulness of interactions differs for formal and informal mentors, or changes from fall to spring. Results indicate that teachers spend more mentoring time with informal mentors compared to formally assigned mentors, and find interactions with informal mentors to be more helpful than with formal mentors, on some mentoring topics. Implications are discussed for further research on new teacher mentoring.

Introduction

While the teaching occupation has not historically invested heavily in the kinds of structured induction and initiation processes common in other professions (Lortie, 1975), concerns about teacher quality and retention have driven the expansion of induction activities over the past few decades. Although 8 out of 10 beginning teachers in 1999-2000 participated in an induction program (Smith & Ingersoll, 2004), very little is known about whether and how these programs helped novices improve their practice. The most common features of current induction programs include the assignment of beginning teachers to mentors, new teacher workshops and seminars, opportunities for novices to observe and be observed, and opportunities for novices to collaborate with other teachers. Although formal mentoring is the most common form of induction support offered to beginning teachers (Smith & Ingersoll, 2004), what mentoring entails varies across states, districts, and schools (Fideler & Haselkorn, 1999; Johnson & Birkeland, 2003). This wide variability makes it difficult to pin down exactly what supports an induction program encompasses, as the designed aspects of an induction program often comingle with school-level supports and resources available to all teachers. Understanding how the components of induction programs fit together is critical as states and districts are increasingly requiring, funding, and mandating different aspects of induction programs (Smith, 2006).

This paper presents findings from the first year of a five-year study of new middle school math teachers in eight southeastern districts and three northeastern districts. The project as a whole seeks to understand how the components of teacher induction programs fit together to provide coherent support for novice teachers. We focus especially on the role of subject-matter content. Research suggests that both *content knowledge and pedagogical content knowledge* are critical for effective teaching. Teachers weak in either of these areas express more

misconceptions (Hashweh, 1987), and tend to pose questions of low cognitive level (Carlsen, 1990). Higher levels of subject matter knowledge (Darling-Hammond, 2000; Goldhaber & Brewer, 1997; Monk & King, 1994) and pedagogical content knowledge (Ferguson & Womak, 1993; Guyton & Farokhi, 1987; Scheerens, 1995) are associated with higher student achievement (e.g., Darling-Hammond, 2000; Ferguson & Womak, 1993; Goldhaber & Brewer, 1997).

Given the importance of content for teaching, and the attention and resources focused on teacher induction, we believe rigorous, empirical research is needed to identify which features of induction programs make them most effective in (1) increasing teachers' math content and pedagogical content knowledge, (2) improving the math content of their instruction, and (3) fostering subsequent student learning. Though we acknowledge that induction programs serve a variety of functions, such as responding to the organizational and management challenges of first-year teachers (Grossman, 1990), we hypothesize that orienting induction activities to focus on math content and how students learn that content has the potential to serve as a pivotal policy mechanism for teacher learning. Further, we seek to test the notion that making content the focus of new teacher induction could help retain successful teachers, since a primary reason new teachers leave the profession is because they do not believe their instruction is helping students learn (Johnson & Birkeland, 2003).

The broad substantive questions we seek to address in the overarching study are, *What aspects of teachers' induction experiences focus on content and how students learn content, and to what extent is the content focus of induction programs associated with improved math teacher content and pedagogical content knowledge, alignment and/or quality of instruction, and student learning?* Recent research suggests that early content-focused professional development experiences can shape instruction (Luft, Roehrig, & Patterson, 2003). We wish to build on this

work to explore how the focus of interactions between beginning teachers and their formal and informal mentors influences teachers' knowledge, instruction and student achievement.

In this paper we begin our exploration to understand the differing roles of formal and informal mentors, and their relative focus on content and other areas. There is considerable variation in the characteristics and quality of teachers' mentoring experiences (Ingersoll & Kralik, 2004). Schools are social environments, and teachers tend to seek support from peers, especially those who are in close proximity (Coburn & Russell, 2008). In order to understand how best to foster instructional improvement among new teachers through mentoring and induction, it is necessary to include the role of informal mentors – individuals not formally assigned as mentors to whom teachers turn for support – in studying new teachers' learning experiences.

We know from the literature that beginning teachers often seek out informal mentors, in addition to their officially assigned formal mentors (i.e., mentors assigned by their school, district or university, or state). However, we know little about how the roles of formal and informal mentors differ, the extent to which the content focus of interactions differs across formal and informal mentors, and how those interactions may change as the school year progresses and the beginning teacher gains more classroom experience. For example, are informal mentors complementary to formal mentors, providing assistance in different areas than their formal mentor, or do they provide additional assistance in the same areas?

This paper takes an initial step toward identifying the conditions under which mentoring is associated with improvement in the effectiveness of new teachers by describing the characteristics, content, and variation of teachers' mentoring experiences. The full project includes a comprehensive array of data—twice yearly beginning teacher surveys and interviews;

a teacher knowledge test and 4 classroom observations per year; formal and informal mentor and principal interviews, and a survey of one key formal mentor. This initial paper exploring interactions between beginning teachers and their formal and informal mentors is based on fall and spring 2007-2008 survey data from the first cohort of teachers, who were beginning mathematics teachers in the fall of 2007.

Using data from surveys of beginning teachers and their formal and informal mentors, the paper answers three main sets of research questions. First, *how much time do beginning teachers spend with their formal and informal mentors, how does this change from fall to spring, and what is the focus of their interactions?* Here we examine differences between formal and informal mentors by contrasting the amount of time spent on support focused on mathematics with other types of support—classroom management, expectations, parent involvement, emotional support and general instructional support. We examine whether the content of interactions differs for formal and informal mentors, and the extent to which the content of interactions changes from fall to spring.

Secondly, we ask *how helpful do teachers consider their interactions with their formal and informal mentors?* Specifically, we ask *what topic areas of support did teachers rate as most helpful for their teaching and do responses differ by formal or informal mentor, and do ratings of helpfulness change from fall to spring?* Our third question asks *to what extent do teachers receive the type of support from their formal and informal mentors that they find most helpful to their instruction?* Here we compare (1) the level of focus teachers say was devoted to different topics in their interactions with mentors, with (2) the extent to which teachers report the topics to be helpful, to determine the extent to which teachers are receiving the type of support they find most helpful.

Methods

Data presented in this paper are from semiannual surveys completed by beginning seventh and eighth grade math teachers in the first year of the study. Twenty teachers in eight school districts that participated in the study in 2007-2008 completed the surveys. The surveys collected extensive information on the support teachers receive from multiple colleagues who have a mentoring role, including individuals who were formally assigned by their school or district to serve as a mentor (formal mentors) as well as individuals who provided support but were not specifically assigned to a mentoring role (informal mentors). In December of their first year of teaching, teachers identified up to three formal mentors and up to five informal mentors and provided information about the amount of interaction they had with each mentor, the content of these interactions, and the degree of helpfulness, for improving their teaching, of each mentoring topic addressed up to that point in the school year. In May of the same school year, teachers provided the same information for the second semester for formal and informal mentors identified in the December survey, and also provided this information for up to one new formal mentor and up to three new informal mentors.

Measures

The specific survey question about topic coverage and helpfulness of mentor interactions asked teachers, considering interactions with each mentor across either the entire first half or the entire second half of the school year, *how much of a focus was each of the following general topics/areas, and how helpful was each topic/area in improving your teaching?* Responses to the question about mentoring focus were on a three-point scale (coded 0 = *Not a focus*, 1 = *Minor focus*, 2 = *Major focus*), and helpfulness ratings were on a four-point scale (coded 0 = *Not*

helpful, 1 = *Slightly helpful*, 2 = *Moderately helpful*, 3 = *Very helpful*). Teachers provided focus and helpfulness responses with regard to each individual formal mentor; however, the survey asked teachers to consider all informal mentors together in rating the focus and helpfulness of mentoring provided by these individuals. Teachers who identified new formal or informal mentors on the May survey provided information about the content focus and helpfulness of interactions with these mentors considering the entire school year, rather than the time between the December and May surveys. Consequently, information about new mentors is excluded from analyses that compare fall and spring semester mentoring content or helpfulness. Teachers rated the focus and helpfulness of up to fourteen specific topics. These topics were grouped into a typology of mentoring content for analysis purposes, according to the broader domains that each specific content area addresses. The typology includes six groups, shown in figure 1.

Data that teachers provided on the December and May surveys regarding the frequency and duration of mentor interactions were used to estimate an overall number of mentoring hours the teacher received, and each teacher's ratings of amount of focus devoted to each domain in the typology were then used to allocate total mentoring hours to each domain. First, we calculated the total amount of mentoring teachers received from each mentor, using the following formula:

$$\begin{aligned} \text{Total time} = & \text{ [Frequency of formal meetings * Average duration of formal meetings]} \\ & + \text{ [Frequency of informal communications * 7.5 minutes]} \end{aligned}$$

Responses to the survey questions about frequency of formal in-person meetings and informal communications (including informal hallway conversations as well as email) were given on a seven-point scale, corresponding to a range of frequencies. For example, on the December

survey, the mid-range response option was *A few times a month (7-12 times)*. In our estimates of the total amount of time spent interacting with each mentor, we used the midpoint of the range provided for each response option on the scale. For instance, the mid-range response was estimated to be 9.5 times, since 9.5 is mid-way between 7 and 12. We used a similar strategy to convert responses to the survey questions about the average length of meetings with each mentor. This question was on a four-point scale, with each response option a range (e.g., *15 minutes to 30 minutes*). In our estimates, we again took the mid-point of the range corresponding to each option (e.g., 22.5 minutes). Because informal communications can take a variety of forms, we assigned all informal communications to be 7.5 minutes in length (the shortest duration of mentor interactions a teacher could designate was *less than 15 minutes*, which translated to 7.5 minutes when we took the mid-point of 0 and 15). To estimate the total amount of mentoring time each teacher received from each mentor, we multiplied the estimate of frequency of formal in-person meetings by the meeting duration estimate, and added to this the product of the estimate of informal communication frequency and 7.5. While this procedure may result in an overestimate of total mentoring time, the overestimate applies uniformly across teachers in our sample and, therefore, enables us to make comparisons of relative time spent on each domain in our typology.

Next, we distributed the total mentoring time across the six mentoring domains. To estimate the amount of time spent on activities within each domain, we considered each teacher's combination of major and minor focus ratings for interactions with each mentor and allocated total mentoring time proportionally to the amount of focus spent on each domain, using the following formula:

$$\text{Time per domain} = \frac{\text{Focus rating} * \text{Total time}}{[(2 * \text{Number of } \textit{major focus} \text{ domains}) + (\text{Number of } \textit{minor focus} \text{ domains})]}$$

Ratings of *major focus* were given twice the weight of *minor focus* ratings. In addition, for the two typology domains comprised of multiple items (math-related instructional support and general instructional support), we assigned the entire typology the greatest focus rating among its component items. The number of hours spent on each domain was estimated by multiplying the focus rating for the domain by the total mentoring time, and then dividing by the sum of the number of domains designated as minor foci and twice the number of domains designated as major foci. Time allocated to each domain was then averaged across all mentors.

Ratings of helpfulness of activities within each domain were taken directly from teachers' four-point scale responses on the surveys. For the two domains comprised of multiple items, an average helpfulness score for each mentor at each time period was computed using each item in the domain. Helpfulness ratings for each domain were then averaged across mentors.

Analysis

For the descriptive analysis, we present means and standard deviations for both amount of mentoring time and the helpfulness of each typology domain. We also provide frequencies for the survey questions from which the mentoring time and helpfulness variables were derived. To compare the mentoring time and helpfulness between the first and second semesters and between formal and informal mentors, we ran t-tests on the mean differences for each typology domain. Additionally, we present bivariate correlations to assess the relationship between the amount of mentoring received in each domain and teachers' helpfulness ratings of mentoring in the domain.

Results

Amount and Type of Mentoring

Our first set of research questions focuses on the overall amount of mentoring and the focus of this mentoring received by first-year teachers, and how it varies by type of mentor and over time. Table 1 presents the average number of hours of mentoring first-year teachers received in various areas from both formal and informal mentors. Over the entire school year, first-year teachers received many hours of mentoring over a variety of topics. In particular, teachers received about 22 hours of mentoring focused on math instructional support as well as on classroom management. It appears that teachers receive more mentoring assistance focused on math instructional support and classroom management and less mentoring on parent involvement, but the small sample in this single cohort limits our ability to find statistically significant differences.

Table 2 provides more detail on the relative focus of the mentoring teachers received overall. Teachers were most likely to have classroom management and overall math instructional support as major foci of their mentoring relationships. However the major focus on overall math instructional support masks variation in the specific types of math support teachers received. Within math instructional support, teachers were most likely to receive mentoring with a major focus on what mathematics content to teach. Most teachers did not receive any mentoring that focused on deepening their own subject matter knowledge. No teachers reported a major focus of their mentoring was on deepening their subject matter knowledge, individualized instruction in math, or technology.

The number of mentors teachers had was related to the total amount of mentoring they received, as shown in Tables 3 and 4. Teachers with one formal mentor spent about 19 hours

with that mentor over the entire school year, while teachers with two and three formal mentors spent about 32 hours and 42 hours with their mentors, respectively. Likewise, teachers received more informal mentoring when they had more informal mentors. Although teachers with multiple formal mentors received more mentoring in total, it does not appear that each formal mentor adds the same amount of mentoring. This is in contrast to the hours spent with informal mentors, as teachers with two informal mentors received more than double the amount of total mentoring than teachers with one informal mentor. As teachers have four or more informal mentors, there does not appear to be an increase in the total amount of mentoring received, although additional mentors may be benefiting teachers by having more diverse sources of assistance. These findings will be explored further once more data are available.

Table 5 presents results on the amount of mentoring received by first-year teachers from formal and informal mentors to explore whether the type of mentoring relationship is related to the content of the assistance received. In general, teachers received more mentoring from informal mentors than from formal mentors. These differences were not statistically significant once the Bonferroni correction was used to control for multiple comparisons, although they remain relatively large and of substantive interest. Teachers received more mentoring from informal mentors in math instructional support, classroom management, parent involvement, and emotional support. Future analyses should try to disentangle why informal mentors provide more support in these areas, perhaps due to proximity or better mentor-mentee match. First-year teachers received similar amounts of mentoring from formal and informal mentors in general instructional support and expectations for teachers.

In general, first-year teachers received similar amounts of mentoring in the second half of the year as they did in the first half of the year (see Table 6). The mentoring teachers received in

math instructional support, general instructional support, expectations for teachers, parent involvement, and emotional support was about evenly distributed between the two halves of the school year. Teachers did receive more mentoring focused on classroom management in the first half of the year (about 13 hours) than they did in the second half of the year (about 8 hours), although this difference is no longer statistically significant when corrected for multiple comparisons.

Table 7 provides more detail on the interaction between the type of mentoring relationship and type of help received. Consistent with the overall results, there were few differences in the amount of mentoring teachers received in each focus area between the two time periods. The exception again is classroom management, in which teachers received more mentoring from informal mentors in the first half of the school year. There was no statistically significant difference in the amount of classroom management mentoring received from formal and informal mentors in the spring. Thus it appears that while teachers receive classroom management assistance from multiple mentors throughout the year, they receive the most assistance from informal colleagues at the beginning of their first year of teaching.

Helpfulness of Mentoring Interactions

The second set of research questions address the extent to which new teachers find mentoring helpful in each of the six typology domains, and also whether teachers' helpfulness ratings change over time or vary by formal and informal mentors. Table 1 displays new teachers' average helpfulness ratings in each domain over the entire first year of the study, for all mentors. Teachers rate mentoring that focused on emotional support as being especially helpful, and a focus on classroom management is also rated highly, on average. Mentoring that provides

support for math instruction and mentoring focused on school or district expectations of the teacher have average ratings that suggest these topics are moderately helpful. Mentoring in the areas of general, non-math instruction and parent involvement have somewhat lower helpfulness ratings in this sample. However, the small sample size of the first-year teacher cohort limits our ability to find statistically significant differences among helpfulness of the mentoring domains.

Table 8 shows the number of teachers whose average helpfulness rating in the six domains across mentors fell into each of the four rating categories. The table is divided into scores averaged across all mentor types, and also averaged across all informal mentors and all formal mentors separately. One finding of note is that there was only one teacher who found any of the domains completely unhelpful, and that was only for the parent involvement domain for all mentors and for formal mentors, but not for informal mentors. In other words, teachers in our sample find mentoring in any topic area to be at least a bit helpful, for the most part. There also tend to be few teachers in the slightly helpful category, particularly when ratings are restricted only to informal mentors. For all mentor types and especially for formal mentors, the highest number of teachers fell into the moderately helpful rating category, but this was not the case for informal mentors. In all domains except general instruction support, the highest number of teachers rated mentoring from informal mentors as very helpful.

The distinction between the helpfulness of formal and informal mentors is also evident in Table 9, which presents mean helpfulness scores in each domain for both formal and informal mentors, and tests the significance of the differences in the means for these two groups. In all six domains, teachers' average helpfulness ratings were higher for informal mentors, although only some of these differences were significant, in part because of the small sample size in this comparison. The difference in the helpfulness of formal and informal mentors was highly

significant in the areas of classroom management and emotional support, and was significant only without adjusting for multiple comparisons in the area of expectations of teachers. The difference in the helpfulness of mentoring on parent involvement also appears to be quite large, although it is not significant because of the especially low number of teachers with ratings on this domain. Interestingly, there were smaller differences in the helpfulness of formal and informal mentors in the instruction-related mentoring domains, including math instruction and, especially, general instruction. This finding suggests that the distinction between formal and informal mentors is less important for the quality of mentoring on issues related to classroom instruction, but that informal mentors provide teachers with better support in keeping the classroom in order and in aspects of their roles beyond instruction.

Table 10 compares teachers' average helpfulness ratings in the first and second halves of the school year, across mentor types. For the most part, helpfulness scores were higher for the first semester of school, except in the area of expectations of teachers. None of these differences were significant after adjusting for multiple comparisons, and only classroom management was significantly higher in the first semester without adjustment. However, some of the differences are fairly large, and are probably not significant mainly because of the small sample size, as mentioned previously. In particular, emotional support received a relatively high average helpfulness rating in the first semester, suggesting that teachers in our sample really appreciate having a friendly shoulder to lean on in the early months of teaching. The helpfulness of math instruction support was also rated highly in the first semester in particular, indicating that these teachers valued content-specific teaching support as they got started with their first year of teaching. Still, there is little evidence in our analysis to suggest that teachers' perceptions of the

helpfulness of mentoring in these six domains changes much over the course of their first year teaching.

Relationship Between Type of Support Received and Helpfulness

The third research question addresses the relationship between the topics mentors focus on with the teachers they work with and teachers' perception of the helpfulness of these topics for improving their teaching. Table 1, which includes both average amount of mentoring time and average helpfulness ratings for each typology group, shows that the two domains that receive the most attention in mentoring (classroom management and math instruction support) have average helpfulness scores that are on the high end compared to the other domains. The least amount of mentoring time is spent on parent involvement, which also has the lowest average helpfulness rating. However, this "more is better" pattern does not hold for all domains. For example, the emotional support domain has average hours of mentoring time that are fairly low, but it receives the highest average rating for helpfulness.

We computed Pearson product-moment correlations to quantify the bivariate relationship between the domains covered in the mentoring teachers receive and the average helpfulness rating each teacher gave for these domains, and we also tested the statistical significance of each correlation. Table 11 shows the correlations and significance level for each typology group, shown in bold, and also for items within each domain for domains with multiple items, not bolded. The strongest relationship occurs in the emotional support domain, with a positive correlation of .79 indicating that teachers in our sample who are getting more friendly support from their mentors also tend to be more enthusiastic about this type of help. The correlation between focus on parent involvement and its helpfulness is also quite high and highly significant,

although in general teachers do not get a lot of support in this area, nor do they rate it particularly highly in helpfulness, on average. Still, teachers in our sample who do get more mentoring in this area tend to find it more helpful. There is a moderately high positive correlation in the expectations domain, which is significant. The correlation is lower but still positive for classroom management, and is not significant, so the amount of mentoring teachers have in this domain is not clearly related to how helpful they find it.

Although we predicted there would be a relationship between mentoring focused on both math and general instruction and the helpfulness ratings teachers give for these domains, we did not find such a relationship. The correlations for these two domains are both very low, negative, and not significant. These domains also happened to be the two typology groups that comprise multiple items, so we considered the possibility that combining the items into domains somehow masked this relationship. However, we also ran correlations on how much mentoring focused on each item in these two domains and how helpful the individual items are, and found little evidence of a relationship, with the exception of a moderate correlation between a focus on what math content to teach and teachers' perceived helpfulness of this topic. There was a fairly high negative correlation between focus and helpfulness for deepening teachers' subject-matter knowledge of math, but few teachers rated the helpfulness of this item since few had mentors who focused on it at all, so the relationship was not significant. This finding suggests that the teachers in our sample who get more mentoring focused on mathematics find it less useful than teachers who receive less content-focused mentoring. We will explore this finding as our work progresses. It might be that teachers who are especially challenged by mathematics content are seeking out content-focused assistance from their mentors, but are not equipped to benefit from such aid. Or, it might be that mentors are better at providing other dimensions of support besides

content-focused support, which we know from the literature takes a special combination of content and pedagogical content knowledge.

Discussion

Our first research question focuses on the content of beginning middle school math teachers' interactions with mentors, and the extent to which the content of these interactions changes across the school year and depending on whether the mentor is formally assigned to work with the teacher. Our results suggest that informal mentors play a substantial role in providing support to new teachers. Generally, we find that informal mentors supplement, rather than supplant, the support provided by formally assigned mentors. However, our results indicate that, compared with formal mentors, informal mentors provide more classroom management, parent involvement, emotional, and math instructional support. Although some of these comparisons are not statistically significant when adjusted for multiple comparisons, the findings point to important patterns to investigate more fully in future analyses. Furthermore, that more mentoring time is spent with informal than with formal mentors across the school year highlights the importance of understanding the kinds of supports that informal mentors provide. Only classroom management appears to differ in amount of focus across the two halves of the school year, with teachers receiving more support in the first half of the year.

Our second research question focuses on how helpful beginning teachers consider their interactions with mentors, and the extent to which they rate helpfulness of interactions differently depending on whether they occurred in the first or second half of the school year, or with formally assigned or informal mentors. Results indicate that teachers perceive informal mentors' support to be more helpful than support from formal mentors with regard to classroom

management, expectations, and emotional support, again suggesting the importance of further investigation into the role of informal mentors in supporting new teachers. Only classroom management support appears to be differentially helpful early in the school year, when new teachers are especially likely to be establishing routines in their classrooms. An additional finding is that, with only one exception, teachers perceived all mentoring support to be helpful for their teaching, although the degree of helpfulness varied.

Our third research question focuses on the extent to which teachers receive the type of support from formal or informal mentors that they find most helpful to their instruction. Our results indicate that, even though teachers receive relatively little emotional support from their mentors compared with support on other topics, there is a strong, positive correlation between mentoring emphasis on emotional support and its perceived helpfulness. This suggests that first-year teachers especially value the psychosocial component of the mentoring relationship, which is consistent with what we know about the challenges of being a first-year teacher.

Our results also provide insight into the role of math content in new teacher mentoring. Results indicate that math instructional support received a lot of attention in mentor interactions. However, when we considered the individual topics that comprise math instructional support, we found that deciding what math content to teach was emphasized in mentoring more than deepening math content knowledge, understanding how students learn math, or individualized instruction in math. Given what we know about the importance of a teacher's content and pedagogical content knowledge for improving student achievement, we would expect that mentoring that emphasizes enhancing teachers' understanding of math and how to teach it would be particularly influential in improving instruction. Future analyses will incorporate qualitative

data about mentor interactions in order to understand in more detail the specific nature of math-related support teachers receive and how this support impacts their instruction.

These findings introduce several important questions regarding formal and informal mentor relationships that could help explain these patterns. One question that emerges from our analysis is what motivates a new middle school math teacher to enlist the support of an informal mentor. It is possible that teachers may form a relationship with an informal mentor because of perceived inadequacies in the formal mentoring available, a lack of grade level or subject match with the formally assigned mentor, or as a function of the beginning teacher's personality. The particular reasons for seeking out an informal mentor may have implications for the content of these interactions or the extent to which teachers perceive them as helpful.

Another question arising from our analysis is whether individual characteristics of formal and informal mentors within the teacher's school or district are related to the content of support provided or to its helpfulness. Formal mentors have the authority of being part of a formal, required program, and may also be responsible for providing support to multiple teachers. In some cases, formal mentors are former teachers promoted to a mentoring role, who operate of the district office, whereas in other cases formal mentors may be current teachers. It may be the case as well that informal mentors tend to be colleagues located in close proximity to the teacher, which would put them in a position to provide more classroom management and emotional support on a day-to-day basis. Future analyses should investigate the relationship between a mentor's location or background and the content and helpfulness of mentoring interactions. In addition, given the possibility that teachers may have multiple formal mentors, it is important to study the extent to which coordination among these mentors influences the helpfulness of the support they provide for teachers' instruction.

It will also be especially important to understand how the role of formal and informal mentors evolves over the second and third year of teaching. Many formal mentoring programs are available only for the first year of teaching, but new teachers often believe they need mentoring for longer. This may be where the role of the informal mentor really takes shape.

Overall, our findings suggest a need to explore in more detail the particular content and character of new teacher mentoring. Understanding the role of both formally assigned supports and supports teacher seek out is key for developing induction programs that hold promise for improving instruction and student achievement.

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Figure 1. Description of Typology of Mentoring Topics.

| Typology group name | Content areas covered by this domain |
|------------------------------------|--|
| Classroom management | Classroom management issues |
| Expectations | Expectations for teachers in the school or district, including paperwork and administrative tasks |
| Parent involvement | Parent involvement matters |
| Emotional support | Psychosocial supports for teachers, including stress management and emotional support |
| Math-related instructional support | Supports for instruction that are specific to teaching math, including teacher understanding of math topics, how students learn math, what math content to teach, and individualized instruction in math |
| General instructional support | Supports for instruction that are not related to math, including technology and working with low-achieving students |

Table 1. Average hours of mentoring time teachers had in the 2007-2008 school year across all mentors, and average helpfulness ratings for each mentoring type.

| Typology Group | Average hours of mentoring time | | Average Helpfulness Rating ^a | |
|-----------------------------|---------------------------------|----|---|----------------|
| | Mean (StDev) | N | Mean (StDev) | N ^b |
| Classroom Management | 21.94 (23.65) | 20 | 2.16 (0.51) | 19 |
| Expectations | 14.04 (12.67) | 20 | 2.07 (0.73) | 19 |
| Parent Involvement | 12.04 (14.90) | 20 | 1.88 (0.70) | 16 |
| Emotional Support | 15.32 (14.49) | 20 | 2.21 (0.69) | 18 |
| Math Instruction Support | 22.38 (18.38) | 20 | 2.07 (0.54) | 20 |
| General Instruction Support | 17.16 (19.32) | 20 | 1.95 (0.61) | 18 |

^a In the helpfulness scale, scoring is as follows: 0 = Not helpful, 1 = slightly helpful, 2 = moderately helpful, 3 = very helpful.

^b Response rates less than 20 indicate that some teachers did not have a helpfulness rating for any mentors of the type indicated (formal or informal). In almost all cases, a missing helpfulness rating indicates that the mentoring interactions did not include a focus on that typology group.

| Table 2. Number of teachers whose average focus score across mentors fell into each rating scale category, by typology group and items in typology group. ^a | | | |
|---|----------|-------------|-------------|
| | No focus | Minor focus | Major focus |
| Classroom Management (1 item) | 1 | 7 | 12 |
| Expectations (1 item) | 1 | 15 | 4 |
| Parent Involvement (1 item) | 6 | 12 | 2 |
| Emotional Support (1 item) | 5 | 9 | 6 |
| Math Instruction Support (4 items) | 0 | 6 | 14 |
| How students learn math | 9 | 10 | 1 |
| Deepening subject-matter knowledge of math | 16 | 4 | 0 |
| Individualized instruction in math | 8 | 12 | 0 |
| What math content to teach | 1 | 13 | 6 |
| General Instruction Support (2 items) | 0 | 13 | 5 |
| Technology | 10 | 10 | 0 |
| Working with low-achieving students | 6 | 13 | 1 |

N = 20
^a Teachers' focus scores for each mentor are averaged across mentors for both informal and formal mentors, and then are rounded to the nearest integer to fit into the 3-point focus scale.

| Table 3. Average hours of formal mentoring time by the number of formally assigned mentors a teacher has, full school year 2007-2008. | | |
|--|--|---|
| Number of Formal Mentors | Mean Hours of Formal Mentoring (StDev) | N |
| 1 | 19.28 (9.48) | 8 |
| 2 | 32.14 (19.22) | 4 |
| 3 | 42.23 (29.23) | 8 |

| Table 4. Average hours of informal mentoring time by the number of informal mentors a teacher has, full school year 2007-2008. | | |
|---|--|---|
| Number of Informal Mentors | Mean Hours of Informal Mentoring (StDev) | N |
| 0 | | 3 |
| 1 | 37.22 (60.19) | 4 |
| 2 | 91.08 (56.28) | 5 |
| 3 | 109.67 (82.92) | 4 |
| 4 | 22.52 (No SD) | 1 |
| 5 | 103.82 (47.28) | 2 |
| 6 | 163.98 (No SD) | 1 |

| Typology Group | Formal Mentors | Informal Mentors | T- test of difference in means |
|-----------------------------|----------------|---------------------|--------------------------------|
| | Mean (StDev) | Mean (StDev) | |
| Classroom Management | 7.00 (7.28) | 14.94 (17.76) | * |
| Expectations | 4.71 (4.09) | 9.32 (11.44) | |
| Parent Involvement | 2.96 (3.39) | 9.08 (13.42) | * |
| Emotional Support | 4.57 (3.91) | 10.75 (12.76) | * |
| Math Instruction Support | 5.72 (3.99) | 16.66 (17.39) | * |
| General Instruction Support | 6.06 (6.34) | 11.10 (14.49) | |
| | N = 20 | N = 20 ^a | |

^a Three of the twenty teachers did not have any informal mentors, but were included in the denominator of the means calculations.
* p < .05 without adjustment for multiple comparisons. Note that if the Bonferroni correction is used, no differences are significant.

| Typology Group | Fall | Spring ^a | T- test of difference in means |
|-----------------------------|---------------|---------------------|--------------------------------|
| | Mean (StDev) | Mean (StDev) | |
| Classroom Management | 13.00 (14.24) | 8.28 (10.44) | * |
| Expectations | 6.28 (6.05) | 7.27 (7.60) | |
| Parent Involvement | 5.87 (7.90) | 6.03 (7.94) | |
| Emotional Support | 5.23 (7.20) | 9.79 (10.58) | |
| Math Instruction Support | 10.63 (9.64) | 10.70 (12.50) | |
| General Instruction Support | 8.62 (13.25) | 7.74 (9.45) | |
| | N = 20 | N = 20 | |

^a Does not include minutes of mentoring from mentors who were newly identified in the spring
* p < .05 without adjustment for multiple comparisons. Note that if the Bonferroni correction is used, no differences are significant.

| Typology Group | Formal Mentors | | Informal Mentors | |
|-----------------------------|----------------|---------------------|------------------|---------------------|
| | Mean (StDev) | | Mean (StDev) | |
| | Fall | Spring ^a | Fall | Spring ^a |
| Classroom Management | 3.73 (4.55) | 3.36 (3.66) | 13.51 (11.49) | 6.14 (8.11) |
| Expectations | 2.23 (1.92) | 2.41 (2.59) | 5.95 (6.43) | 6.07 (6.67) |
| Parent Involvement | 1.29 (1.33) | 1.74 (3.03) | 6.63 (8.53) | 5.36 (6.91) |
| Emotional Support | 1.52 (1.57) | 2.95 (3.19) | 5.29 (7.79) | 8.54 (9.29) |
| Math Instruction Support | 3.01 (2.23) | 2.62 (2.35) | 10.89 (9.63) | 10.09 (13.29) |
| General Instruction Support | 3.28 (4.54) | 2.78 (3.26) | 7.62 (10.91) | 6.2 (7.84) |
| | N = 14 to 20 | | | |

^a Does not include minutes of mentoring from mentors who were newly identified in the spring
* p < .05 without adjustment for multiple comparisons. Note that if the Bonferroni correction is used, no differences are significant.

Table 8. Number of teachers whose average helpfulness score across mentors fell into each rating scale category, by mentor type ^a

| | Not helpful | Slightly Helpful | Moderately Helpful | Very Helpful | Total N ^b |
|--|-------------|------------------|--------------------|--------------|----------------------|
| All Mentors (including formal and informal) | | | | | |
| Classroom Management | 0 | 2 | 11 | 6 | 19 |
| Expectations | 0 | 4 | 9 | 6 | 19 |
| Parent Involvement | 1 | 1 | 10 | 4 | 16 |
| Emotional Support | 0 | 3 | 7 | 8 | 18 |
| Math Instruction Support | 0 | 2 | 14 | 4 | 20 |
| General Instruction Support | 0 | 4 | 10 | 4 | 18 |
| Formal Mentors Only | | | | | |
| Classroom Management | 0 | 5 | 10 | 4 | 19 |
| Expectations | 0 | 6 | 7 | 6 | 19 |
| Parent Involvement | 1 | 2 | 7 | 4 | 14 |
| Emotional Support | 0 | 3 | 9 | 6 | 18 |
| Math Instruction Support | 0 | 3 | 13 | 4 | 20 |
| General Instruction Support | 0 | 4 | 9 | 3 | 16 |
| Informal Mentors Only | | | | | |
| Classroom Management | 0 | 0 | 6 | 10 | 16 |
| Expectations | 0 | 2 | 5 | 7 | 14 |
| Parent Involvement | 0 | 1 | 5 | 6 | 12 |
| Emotional Support | 0 | 3 | 2 | 8 | 13 |
| Math Instruction Support | 0 | 1 | 6 | 8 | 15 |
| General Instruction Support | 0 | 3 | 8 | 3 | 14 |

^a Teachers' helpfulness scores for each mentor are averaged across mentors and by mentor type, and then are rounded to the nearest integer to fit into the 4-point helpfulness scale.

^b Response rates less than 20 indicate that some teachers did not have a helpfulness rating for any mentors of the type indicated (formal or informal). In almost all cases, a missing helpfulness rating indicates that the mentoring interactions did not include a focus on that typology group.

Table 9. Teachers' average helpfulness ratings for each type of mentoring with formal and informal mentors, full school year 2007-2008

| Typology Group | Formal Mentors | | Informal Mentors | | T- test of mean differences |
|-----------------------------|---------------------------|----------------|---------------------------|----------------|-----------------------------|
| | Mean (StDev) ^a | N ^b | Mean (StDev) ^a | N ^b | |
| Classroom Management | 1.95 (0.60) | 19 | 2.47 (0.56) | 16 | **, # |
| Expectations | 1.92 (0.81) | 19 | 2.32 (0.77) | 14 | * |
| Parent Involvement | 1.78 (0.87) | 14 | 2.17 (0.62) | 12 | |
| Emotional Support | 2.10 (0.67) | 18 | 2.38 (0.87) | 13 | **, # |
| Math Instruction Support | 2.02 (0.55) | 20 | 2.18 (0.66) | 15 | |
| General Instruction Support | 1.95 (0.67) | 16 | 1.96 (0.63) | 14 | |

^a In the helpfulness scale, scoring is as follows: 0 = Not helpful, 1 = slightly helpful, 2 = moderately helpful, 3 = very helpful.

^b Response rates less than 20 indicate that some teachers did not have a helpfulness rating for any mentors of the type indicated (formal or informal). In almost all cases, a missing helpfulness rating indicates that the mentoring interactions did not include a focus on that typology group.

* p < .05 ** p < .01 without adjustment for multiple comparisons. # indicates significance at the .05 level using the Bonferroni correction.

| Table 10. Teachers' average helpfulness ratings for each mentoring type during fall 2007 and spring 2008, including both formal and informal mentors | | | | | |
|---|---------------------------|----------------|---------------------------|----------------|-----------------------------|
| Typology Group | Fall ^a | | Spring ^a | | T- test of mean differences |
| | Mean (StDev) ^b | N ^c | Mean (StDev) ^b | N ^c | |
| Classroom Management | 2.32 (0.56) | 19 | 2.00 (0.60) | 18 | * |
| Expectations | 2.02 (0.89) | 19 | 2.09 (0.75) | 19 | |
| Parent Involvement | 2.02 (0.83) | 14 | 1.84 (0.71) | 15 | |
| Emotional Support | 2.54 (0.54) | 14 | 2.14 (0.73) | 18 | |
| Math Instruction Support | 2.21 (0.62) | 20 | 1.92 (0.64) | 20 | |
| General Instruction Support | 2.02 (0.70) | 17 | 1.83 (0.73) | 17 | |

^a Does not include minutes of mentoring from mentors who were newly identified in the spring
^b In the helpfulness scale, scoring is as follows: 0 = Not helpful, 1 = slightly helpful, 2 = moderately helpful, 3 = very helpful.
^c Response rates less than 20 indicate that some teachers did not have a helpfulness rating for any mentors of the type indicated (formal or informal). In almost all cases, a missing helpfulness rating indicates that the mentoring interactions did not include a focus on that typology group.
* p < .05 without adjustment for multiple comparisons. Note that if the Bonferroni correction is used, no differences are significant.

| Table 11. Correlations between teachers' ratings of mentoring focus and the helpfulness of the topic if it was a minor or major focus ^a | | | |
|---|-------------|--------------|----|
| Topic area | Correlation | Significance | N |
| Classroom Management (1 item) | .44 | | 19 |
| Expectations (1 item) | .50 | * | 19 |
| Parent Involvement (1 item) | .68 | ** | 16 |
| Emotional Support (1 item) | .79 | *** | 18 |
| Math Instruction Support (4 items) | -.05 | | 20 |
| How students learn math | .10 | | 17 |
| Deepening subject-matter knowledge of math | -.58 | | 8 |
| Individualized instruction in math | .41 | | 18 |
| What math content to teach | .50 | * | 20 |
| General Instruction Support (2 items) | -.11 | | 18 |
| Technology | .26 | | 17 |
| Working with low-achieving students | .26 | | 17 |

* p < .05 ** p < .01 *** p < .0001
^a Focus scores are on a 3-point scale (No focus, minor focus, and major focus), but teachers were instructed to rate helpfulness of a topic only when it was a minor or major focus; ratings of no focus were treated as missing for this analysis.