Refining a Professional Network

Understanding First-Year Teachers' Advice Seeking

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Abstract

A considerable body of research has suggested that without appropriate supports and learning opportunities on the job, beginning teachers are unlikely to develop effective instructional practices and find success. Informal supports, such as teachers' advice networks, have received less attention in research and policy yet can serve as substantial supports for teachers' development. In this study, we follow Baker-Doyle and define a teacher's intentional professional network (IPN) to be the set of people to whom the teacher chooses to go for advice or information about teaching. In this study, we investigated how first-year teachers participating in an alternative certification partnership were supported by different individuals over the course of their first year of teaching. In particular, we analyzed their IPNs, col-

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lected via survey, to understand exactly which individuals these first-year teachers sought out for advice or information about teaching and, using complementary interview data, investigated why the teachers included those individuals in their professional networks. In addition to reasons for selecting particular individuals within IPNs, we also discuss implications for designing and implementing formal supports for first-year teachers.

Introduction

Teaching is challenging work, and teachers' preservice preparation, even in the best of circumstances, is not enough to achieve ambitious goals for student learning when the teachers enter the classroom. In particular, the demands of teaching cannot be fully anticipated or met by even exemplary preservice preparation alone (Little, 1999). Therefore, teachers need opportunities to learn on the job (Feiman-Nemser, 2012). This need is even greater for first-year teachers, as they are required to learn about a new school context and have the opportunity to try out their understandings in a classroom of their own while formulating their own problems of practice (Feiman-Nemser, 1983).

With a growing number of first-year teachers, the importance of designing schools to support beginning teachers becomes a greater concern system-wide, especially with larger proportions of inexperienced teachers at the most challenging schools (Goldhaber, Quince, & Theobald, 2018; Hannan, Russell, Takahashi, & Park, 2015; Redding & Henry, 2018, 2019; Simon & Johnson, 2015). In fact, the National Center for Education Statistics projects that there will be 342,000 new teacher hires in the United States in 2020 (National Center for Education Statistics, 2015). With first-year teacher rates around 40% of new teacher hires in recent surveys (Warner-Griffin, Noel, & Tadler, 2016), over the next few years, we can reasonably expect more than 100,000 new teachers each year (Ingersoll, Merrill, & Stuckey, 2014). We also know that teacher turnover is especially high during the first years of teaching, with 40%–50% of new teachers leaving within the first 5 years of entry into teaching (Ingersoll & Strong, 2011). As the number and concentration of first-year teachers increase, we will need to consider new ways to support those new teachers' on-the-job learning to retain them and develop them as teachers.

First-year alternative certification (AC) teachers are an especially interesting population when investigating supports for beginning teachers. First, they constitute a substantial portion of the first-year teacher population (Office of Postsecondary Education, 2016). For example, in public schools in Texas, over 30% of first-year teachers are AC teachers (Texas Education Agency, 2019). Second, they tend to have received limited pedagogical training (Ingersoll, Merrill, & May, 2012); therefore, they require considerably more support and on-the-job training as they begin teaching. Third, AC teachers turn over at an even higher rate than traditionally certified teachers, even when controlling for differences in preparation (Redding & Smith, 2017).

A considerable body of research has suggested the importance of supporting new teachers over their first few years of teaching. One well-researched and consequential support for beginning teachers is mentoring (Feiman-Nemser, 2012; Ingersoll & Strong, 2011; Smith & Ingersoll, 2004). However, informal supports (e.g., informal mentors or collaboration with colleagues) have received less attention in research and policy, yet are likely crucial for teachers' development (Coburn, 2001; Desimone et al., 2014), especially given the need to support growing numbers of new teachers. Furthermore, novice teachers report that one of the main reasons they choose to leave the teaching profession is the absence of collegiality among peers (Allensworth, Ponisciak, & Mazzeo, 2009). Therefore teachers' advice networks, while informal and emergent in nature, can serve as a substantial support for teachers' development and help with retention (e.g., Frank, Zhao, & Borman, 2004; Sun, Wilhelm, Larson, & Frank, 2014). In this study, we define a teacher's intentional professional network (IPN; Baker-Doyle, 2012) to be the set of people to whom teachers choose to go for advice or information about teaching. In what follows, we describe our framing and our investigation of how first-year teachers participating in an AC partnership were supported by different individuals over the course of their first year of teaching. In particular, we analyzed their IPNs, collected via survey, to understand exactly which individuals these first-year teachers sought out for advice or information about teaching and, using complementary interview data, investigated why the teachers included those individuals in their professional networks.

Background Literature

We take a social capital perspective (Lin, 2001) and assume that teachers have access to resources and expertise through interactions and that those resources can influence teachers' knowledge, beliefs, or instructional practice. The network of social relations in support of a teacher's instructional improvement can be broadly conceptualized as the teacher's social network in the context of the daily work of teaching (Daly, 2010). A growing body of research has shown that social network interactions influence teachers' knowledge and practice (Daly, Moolenaar, Bolivar, & Burke, 2010; Frank et al., 2004; Penuel et al., 2010; Penuel, Riel, Krause, & Frank, 2009; Sun, Penuel, Frank, Gallagher, & Youngs, 2013; Sun et al., 2014). In other words, teachers' one-on-one interactions with colleagues or other individuals can support their learning. Furthermore, studies have suggested that the expertise of the individuals with whom teachers choose to interact impacts the influence of those interactions (e.g., Penuel et al., 2010; Sun et al., 2014). If teachers interact with more expert individuals, then they learn more than if they had interacted with less expert individuals. Therefore, the expertise of individuals in teachers' advice networks plays an important role in teachers' learning through network interactions.

In recent years, beginning teachers have often been provided with a number of instructional supports as part of formal induction programs (Ingersoll & Strong,

2011). Such supports can include mentoring, instructional coaching, school leader observation and feedback, and formal professional development, among other things. The logic behind providing such instructional supports is to give beginning teachers access to necessary resources and expertise (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; DeAngelis, Wall, & Che, 2013; Goldhaber, 2019; Simon & Johnson, 2015).

Teachers' Professional Networks

Given the host of instructional supports for beginning teachers, one subset of teachers' interactions is particularly interesting: the set of instructional interactions in which they choose to engage. When asking teachers to whom they go for advice or information about teaching, their choices about the interactions in which they choose to engage are revealed. Baker-Doyle (2012) defined IPNs as "personal networks of the individuals that the teachers selected to collaborate and interact with to solve professional problems" (p. 78). Such IPNs are particularly interesting because they are emergent and voluntary and cannot be mandated (Smylie & Evans, 2006; Spillane, Reiser, & Gomez, 2006). As such, they provide an indication of the social relations that beginning teachers deem the most useful in their teaching, whether the support itself is pedagogical or more emotional in nature. In addition, given the steep learning curve within the first year of teaching, it is reasonable to assume that teachers' IPNs might change over their first year of teaching. Hence one way to account for first-year teachers' perceived value of different social relations, and perhaps the uptake of different designed supports, is to investigate their IPNs to understand with whom they choose to collaborate and why.

Beginning teachers' networks. Five relatively recent manuscripts describing investigations of beginning teachers' social networks as resources for their learning provide a foundation for this study. These manuscripts have demonstrated a number of features of beginning teachers' networks, including the role of such networks in learning, the importance of individual teachers' agency in the development of their networks, the importance of physical proximity and opportunities for professional collaboration (e.g., structured time, professional development) in the development of networks, and the differing roles of individuals within schools and outside of schools in a beginning teacher's network (Baker-Doyle, 2012; Fox & Wilson, 2009; Fox, Wilson, & Deaney, 2011; Risser, 2013; Thomas, Tuytens, Devos, Kelchtermans, & Vanderlinde, 2019). Some of these studies take a fairly expansive view of networks to focus on teaching support broadly. For example, Baker-Doyle (2012) surveyed teachers by asking them to list all of the people who supported them in their teaching, and she found that teachers tended to report school-based colleagues with whom they had informal relationships—their IPNs. In addition, Baker-Doyle found that beginning teachers were supported by another group of individuals she called their "Diverse Professional Allies," who tended not to be education professionals but

were important to beginning teachers' development. In this analysis, our focus is on teachers' IPNs.

A subset of these studies, including Baker-Doyle (2012), examined change in beginning teachers' networks. All of these studies followed small samples of teachers over time to examine the changes to their networks. In particular, many of the studies utilized interviews in addition to surveys and observations to understand the perspectives of beginning teachers. For example, Baker-Doyle found that four beginning teachers' support networks grew over the first 3 years in the profession as they added diverse professional allies, whom they described in interviews but did not report on their initial survey. Fox et al. (2011) similarly found that beginning teachers' professional networks grew over the first 3 years in the profession. In contrast, Risser (2013) found that one beginning teacher's professional network decreased in size over time. In this study, Risser collected longitudinal professional network information by observing a novice teacher's Twitter collaboration during the transition from student teaching to the teacher's first semester as the teacher of record. Overall, there is evidence that beginning teachers' professional networks change over time and are important to teachers' learning.

Given the importance of social networks for teacher learning and the emergent nature of those networks, it is important to know more about who teachers decide to include in their networks and why. The majority of the studies of beginning teachers are focused on how to encourage teachers to build their professional networks; however, three of these studies did mention some specific factors that contributed to teachers' professional selection: individuals' expertise or experience (Fox et al., 2011), shared teaching assignments (Risser, 2013), and proximity (Thomas et al., 2019).

Selecting network members. In addition to investigating change over time for a relatively large sample of first-year teachers, we sought to understand these first-year teachers' decisions about who to include in their IPNs. To anticipate their reasons, we looked beyond the beginning network studies to a strand of research on teachers' professional networks that has focused on exactly this dimension: Who do teachers select as part of their professional networks, and why? One of the most common findings pertains to the sociological principle of homophily (i.e., like characteristics; see McPherson, Smith-Lovin, & Cook, 2001). In particular, studies of professional network selection suggested that teachers tend to seek advice from individuals who are the same gender (Frank & Zhao, 2005; Moolenaar, Daly, Sleegers, & Karsten, 2014; Spillane, Kim, & Frank, 2012), are the same race (Spillane et al., 2012), and teach the same grade level (Coburn, Choi, & Mata, 2010; Frank & Zhao, 2005; Moolenaar et al., 2014; Penuel et al., 2010; Spillane, Hopkins, & Sweet, 2015; Spillane et al., 2012). Other factors in decisions about teachers' professional network selection include coparticipation in meetings (Penuel et al., 2010) and convenience (e.g., Coburn et al., 2010, Spillane, Shirrell, & Sweet, 2017).

In addition, there is mounting evidence that expertise influences teachers'

decisions about professional networks. First, previous studies of professional network selection suggested that teachers are more likely to seek advice from those in leadership positions (e.g., instructional coaches; Moolenaar et al., 2014; Spillane et al., 2015; Spillane et al., 2012), likely because they believe that the appointment to a formal position signals expertise. Furthermore, studies of professional network selection suggested that both colleagues' experience teaching and instructional expertise influence teachers' decisions (Baker-Doyle & Yoon, 2010; Coburn et al., 2010; Frank et al., 2010; Moolenaar et al., 2014; Spillane et al., 2015; Spillane et al., 2012; Wilhelm, Chen, Smith, & Frank, 2016). While these reasons why teachers select particular individuals as part of their intentional professional networks are well documented, few studies have examined whether these same reasons apply to first-year teachers.

In the present study, we build on these studies of teachers' professional network selection and look across a larger sample of first-year teachers to understand how their IPNs change over time and begin to understand why they change. Furthermore, we study first-year AC teachers who were provided with a number of supports from the different partners in the AC partnership. We analyze first-year AC teachers' IPNs as a support themselves and as an indication of uptake of the designed supports because such analyses can further our understanding of how to best support first-year teachers. In particular, we investigated the following research questions:

> To whom do beginning teachers go for advice about teaching, and how does that change over the course of their first-year teaching?

> What reasons do beginning teachers give for going to particular people for advice about teaching?

Methods

In this analysis we drew on data from a yearlong longitudinal study of first-year teachers enrolled in an AC partnership through a southwestern university and teaching at 41 different schools in two urban school districts in the southwestern United States. The AC partnership involved partners from an AC program, a private university, and two urban school districts. Each AC partner focused on different aspects of the teaching preparation process: the alternative certification program recruited teachers, the private university offered teacher certification courses, and the school districts hired the teachers. Also, all partners offered training and mentoring. However, as Table 1 shows, the partners intended to support the novice teachers in different ways. These focal teachers were working in schools, scattered across the two partnering school districts, predominantly characterized by high teacher turnover and high percentages of students living below the poverty line.

Through this partnership, the novice teachers were officially supported on their campuses by AC program mentors and university mentors (both which we

call "mentors" because of their relative experience and learning/support focus), as well as interacting with other university instructors in the context of more standard coursework. AC program mentors were often former AC program teachers, often with 3–5 years of teaching experience. University mentors were either university faculty or retired principals working as adjunct instructors for the university. In addition, the school districts often employed school-based instructional coaches and adopted campus mentoring programs, as mandated at the district level. School-based support providers also include principals and other colleagues (i.e., teacher peers). Finally, both districts had adopted policies of giving teachers collaborative meeting time at their schools. We considered all of these potential supports for our analysis.

Participants

The 126 first-year teachers participating in the AC partnership constitute a particularly rich group to investigate first-year teachers' instructional supports because they were provided with a large number of potential support providers. In particular, they had potential AC program, university-based, and school-based support providers. This was a large number of people who were, in theory, there to

Table 1
Partnership Training and Mentoring Efforts

	Partnership Efforts	
	Training	*Mentoring/Coaching*
AC program	Induction program multiple weeks during the summer	Monthly AC program mentor observations with written feedback visits
	Saturday workshops during school year	Additional mentor visits depending on teachers' requests
Private university	Weekly 3-hour workweek classes during school year	Monthly university mentor observation with written feedback
	Weekly 2-hour home/online coursework during school year	Additional mentor visits depending on teachers' requests
School districts	Professional development at different times during the year	Availability of school-based coaches varied by school
	Regular collaborative teacher meetings	Assignment or availability of school-based mentors varied by school

Note. AC = alternative certification.

support each of these beginning teachers. We were interested in understanding the extent to which these potential support providers were perceived as supportive and how teachers navigated the terrain with all of these support providers. To this end, we collected survey data in the fall, winter, and spring to learn how novice teachers' advice networks developed over their first year in the teaching profession and interview data with a subset of teachers in the spring. We advertised the survey to all first-year teachers in the AC program. A sample of 74 of them consented to take the survey and completed the first survey administration, with 40 of them completing the survey at all three time points. The majority female teachers were spread across the grade levels, with the most teachers teaching at the elementary level (see Table 2). At the elementary level, 48.8% of teachers taught the same students across the curricular areas (i.e., were "self-contained"), and the remainder taught some smaller combination of subject matter, perhaps with several different groups of students. Of the elementary teachers, 31.7% (or 13 of 41) taught bilingual classes (i.e., taught in both English and Spanish). At the middle school level, teachers generally taught one subject area, with the most common being English, science, and math (four, four, and three teachers, respectively). Like at the middle school level, at the high school level, teachers taught one of the following subject areas: science (12 teachers), math (4 teachers), English (2 teachers), and social studies (2 teachers). In the spring, we conducted interviews with a convenience sample of 26 of the novice AC teachers to understand more about the extent to which they felt supported by potential support providers. The convenience sample came from two university course sections and were either secondary mathematics teachers or elementary bilingual teachers.

Data Sources

To understand teachers' IPNs and their perceptions of effective support providers, this investigation focused on teachers' IPNs, collected via survey, and the complementary interview data. On the advice network survey, we asked teachers to whom they turn for advice or information about instruction and asked them to list up to six individuals. This approach has been used a number of times and was first validated by Pitts and Spillane (2009) in an effort to study instructional leadership practice, broadly defined. The complementary qualitative data were collected in the form of semistructured interviews and were designed to provide additional informa-

Table 2
Gender and Grade Level of Survey Participants

	Female	Male
Elementary teacher	34	7
Middle school teacher	10	3
High school teacher	17	3

tion about how the beginning teachers were supported during their first year in the profession. We draw on one specific interview question for this analysis: Teachers were asked to look at a list of potential support providers (see the appendix) and list "the 3 that rise to the top in helping you on your way to being [an exemplary teacher]."

Analyses

We began this primarily quantitative mixed-methods analysis (Teddlie & Tashakkori, 2009) with the survey data and examined trends in advice seeking across the sample of 74 teachers who completed the survey in the fall and the subsample of 40 teachers who completed the survey at all three time points: fall, winter, and spring. We compared the findings for the two samples and found no significant differences, indicating that the full sample does not differ significantly from the subsample, so we utilized the full sample for the quantitative analysis.

To answer our first research question, we employed social network analysis (Scott, 2013). In particular, we took an ego-centric approach to analyzing teachers' advice networks. An ego-centric approach refers to a focus on the first-year teachers and their self-reported IPNs rather than a map of a larger network connecting individuals in a comprehensive way. In social network analysis terms, the person who takes the survey is referred to as the *ego* and the person they indicate as part of their network (in this case, they seek advice from them) the *alter*. We were particularly interested in the different roles of the alters and changes to the networks over time. For our quantitative analyses, we utilize summary statistics and significance testing to determine if there were significant changes over time. In particular, we describe changes in network size and alter role groups.

To answer our second research question, we analyzed the interview question asking teachers to describe the three greatest supports. Because our interview question was not specifically focused on IPNs but instead asked about support, our first analysis was to compare alters listed in teachers' IPNs from the survey with supporters listed in the interview to ensure that we could use the interview question about supporters to answer our second research question. In other words, we triangulated the data from the surveys by looking for confirming and disconfirming cases of supporters and network alters. After making this comparison, we systematically coded for the role of the individual they described supporting them and the reasons they gave for listing that individual as a supporter in all 26 interviews. The codes for roles were set by our prior work in categorizing the roles of network alters described on the survey as well as the list of support providers given to the teachers in the interview. All of the coding was conducted by the first two authors with ongoing checks for reliability, with 90% intercoder agreement (Campbell, Quincy, Osserman, & Pedersen, 2013; Miles, Huberman, & Saldana, 2014). We then examined trends in the reasons teachers gave for describing individuals as supporters. We both deductively and inductively coded for the types of support

they received (Miles et al., 2014). Our initial coding scheme included codes of shared experience or characteristics (i.e., homophily), experience or expertise, and convenience (i.e., proximity), based on prior studies of teachers' social network selection. We inductively added codes to account for the types of support provided because the quality of support itself was often given as the reason for describing someone as a support provider. In particular, we added codes for emotional support, instructional support, and logistical support (see Table 3).

In what follows, we first use survey data to describe teachers' IPNs and how they changed over their first year of teaching, and we then draw on interview data to describe the reasons this sample of AC teachers gave for seeking advice from individuals in particular role groups.

Results

Beginning Teachers' Advice Networks

Beginning teachers tended to nominate teacher peers as their network alters (66% of the time, 94% of whom were teachers at their school). In other words, the majority of the people from whom teachers reported seeking advice or information were teacher colleagues (i.e., both veteran and novice teacher colleagues). Our beginning teachers listed someone in a mentoring capacity (i.e., an AC program mentor, a university mentor, or a teacher assigned as their mentor) 27% of the time, with just over half of those being a within-school teacher colleague acting in a mentoring capacity—a school-based mentor.

With respect to change over time, beginning teachers listed significantly fewer IPN alters between the fall survey and the winter and spring surveys (2.01 alters, 1.22 alters, and 1.23 alters, respectively), $p < .001$. In short, the size of the networks decreased over time. Also, over time, novice teachers' IPNs became more school-centric, with 71% of alters in their school at Time 1 and 89% of alters in their school at Time 3, $p < .001$. Furthermore, the trend of increasing the percentage of alters within schools generally was consistent across the role groups within and outside of schools. In particular, in Figure 1, the three right groups of bars represent the percentages of alters who were teachers, mentors, or people in other roles (e.g., friend, spouse) outside of the school, and those percentages decreased over time. In contrast, the percentages for role groups within schools increased or stayed the same over time. In other words, beginning teachers in this study tended to trim their IPNs to people within their schools over the course of their first-year teaching, suggesting that, over time, they did not ask for advice from as many people as they did at the beginning of the year.

Comparing Interview and Survey Data

Table 3
Coding Scheme with Definitions and Examples

Code	Definition	Example
Homophily		
Experience	Based on training, opportunities, and/or challenges	We experience this together and we can help each other out.
Teaching assignment	Based on grade level, content, subject, or language program	So it's really good support because I feel like, OK, we are all going through the same thing—we're all on the same wavelength.
Context	Based on the setting, including neighborhood, school, or students	When I literally had my breakdown, those were the first two people I called, were like my [peer AC teachers] at my school. They were willing to meet up with me and also be on my side. There's 10 of us at my school. Some of us teach similar kids too, so we help each other out with that as well—especially with the same kids.
Goals for teaching	Based on reasons why they joined the profession and expected outcomes	And what I think makes [the AC program] so special is that you have such like-minded people who just want, who are really there, or at least I feel, they're really there for, you know, the progression of, like, everybody's education.
Convenience	Based on proximity or availability	My mentor . . . she's actually there every day so having her as a support system has been amazing.
Experience or expertise	Based on their expertise or their experience	It feels phenomenal to hear someone came into my classroom who is a former assistant superintendent to come into my classroom and say that was really good.
Support		
Instructional	Addresses instruction and assessment	She gives me feedback and I reflect on what I could have done better, what I could have not done better. And she has—her sit-downs with me. . . . She tells me what she saw, what she could see that could be polished a little bit more.
Logistical	Addresses noninstructional procedures	He's really good at navigating the legal structure of teaching—how you're supposed to document everything and telling me, you might not want to tell it to your kids in this way. He was just really good at coordinating the way we would give messages to the kids.
Affective	Addresses feelings, moods, or attitudes . .	The emotional support of saying what do I need, is everything OK, it looks like you're stressed out. Also being able to bring me back to earth and being like, I've been there . . . not a big deal. You're gonna get through it.

Recall that before coding the entire interview data set to describe reasons for seeking advice from particular individuals, we first triangulated our interview and survey data to look for confirming and disconfirming cases and ensure that the interview data were helpful for understanding the IPNs reported in surveys. For 8 of the 10 teachers who completed the survey at all three time points and participated in the interviews, the alters listed on the survey were also described as top supporters within the interviews. In other words, the majority of the time, alters in a teacher's IPN were considered supporters. However, the beginning teachers tended to list additional people as one of their top three supporters who were excluded from their IPNs, indicating that the IPN is perhaps a subset of a set of supporters. For example, one beginning teacher listed teacher peers (listed in her IPN) and her AC program mentor (not listed in her IPN) as supporters.

In Table 4, the first set of columns gives the comparison between the interviews and surveys for the 10 (of 26) interviews with surveyed teachers. In particular, the
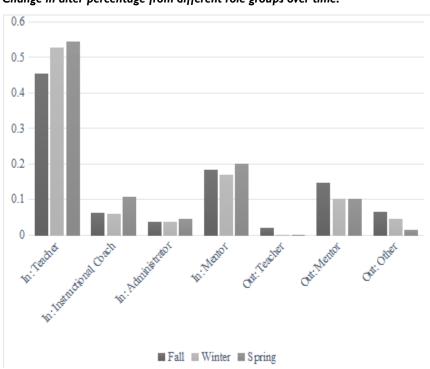
Figure 1
Change in alter percentage from different role groups over time.

Note: "In" indicates a role within school, and "out" indicates a role outside of school.
$n = 74$ in fall, 62 in winter, and 48 in spring.

table gives the frequency and percentage of the interviews in which teachers listed someone in each role as a top supporter and also listed them in their IPNs. For example, the third row shows that 3 of the 10 teachers listed teachers in their school as one of their top three supports, and all 3 of those teachers also listed teachers in their schools in their advice networks. Recall that the most commonly listed IPN alters were teacher peers and school-based mentors. While not the most frequently listed supporters, when these individuals were listed as supporters, they were often also listed in the IPN (see the italicized rows in Table 4). Therefore, we took this as an indication that we could use the interview data about supporters to understand the reasons teachers gave for seeking advice or information from individuals in those roles. In the next section we unpack the interview data to answer this second research question.

Before describing the reasons for nominating particular individuals, we provide more data to support our finding that the IPN appears to be a subset of a teacher's supporters. Two role groups exemplify this finding: AC program mentors and instructional coaches. First, 5 of 10 teachers interviewed and surveyed (and 12 of the 26 total interviews) listed an AC program mentor as one of their top three supporters, but none of them listed an AC program mentor as a member of their IPN. Similarly, an instructional coach was listed as a supporter in 3 of the 10 interviews (and 7 of the 26 total interviews) but was not listed as a part of those 3 teachers' IPNs. Therefore it seems that beginning AC teachers' IPNs constituted a subset of their support networks more broadly. In what follows, we first focus on the role groups of teachers (including mentors) within the schools to describe the reasons why teachers sought them out for advice or information about teaching, and then

Table 4
Top Supporters From Interviews and Compared With Survey, by Role Group

Organization	Role group	Top 3 support,[a] surveyed sample		Top 3 support,[b] full sample, N (%)
		In top 3 supports	Also in network, n (%)	
School	School leader	0	0 (–)	3 (11.5)
	Instructional coach	3	0 (0)	7 (26.9)
	Teachers in school	*3*	*3 (100)*	*6 (23.1)*
	School-based mentor	***3***	***3 (100)***	***8 (30.7)***
AC program	*AC teacher peers*	*7*	*5 (71.4)*	*15 (57.7)*
	AC program mentor	***5***	***0 (0)***	***12 (46.2)***
University	**University mentor**	**5**	**2 (40)**	**8 (30.7)**
	University instructor	5	2 (40)	6 (23.1)

Note. Italic categories represent teachers; boldface categories represent mentors.
[a]$n = 10$. [b]$N = 26$.

we describe reasons presented for some of the other role groups for contrast (see Table 5 for a full set of results from coding for reasons).

Reasons for Advice Seeking

Ten interview participants provided reasons for why they listed a teacher (including mentors) in their school as a supporter. Reasons included same context ($n = 4$); same experience ($n = 3$); same teaching assignment ($n = 2$); convenience ($n = 2$); expertise ($n = 1$); and instructional ($n = 1$), emotional ($n = 1$), or logistical support ($n = 1$; see Table 5 for the breakdown by role group). When they described shared context as a reason, beginning teachers discussed how their teacher colleagues knew what it was like to work in their school or work with the same kids. Reasons

Table 5
Coding Reasons by Role Group

| Role | No. gave reason | Same | | | | Support | | | | |
		Experience	Context	Teaching assignment	Ideals	Conventional	Expertise	Instructional	Emotional	Logistical
AC program										
AC mentor	**6**						**1**	**2**	**2**	**1**
AC teacher peer (not same school)	*7*	*4*		*2*	*2*	*1*	*1*	*1*	*1*	*1*
School										
AC teacher peer	*2*	*2*	*2*			*1*				
Non-AC teacher peer	*3*		*1*	*2*			*1*	*1*		
School-based mentor	***5***	***2***	***2***			***1***			***1***	***1***
Assistant principal	2							1	1	
Instructional coach	4							2	2	
University										
University mentor	**6**						**2**	**5**	**2**	
University instructor	1	1						1		

Note. Italic categories represent teachers; boldface categories represent mentors.

that fell into the category of the same experience included being "in it together" and understanding their struggle. For example, one teacher described,

> When I literally had my breakdown, those were the first two people I called, were like my [peer AC teachers] at my school. They were willing to meet up with me and also be on my side. There's 10 of us at my school. Some of us teach similar kids too, so we help each other out with that as well—especially with the same kids.

Comparing reasons for teacher peers in the school and (AC) teacher peers outside of the school reveals that sharing a teaching context was particularly critical in how they saw other teachers in their school as a source of advice. Furthermore, teachers never mentioned a shared context as a reason for listing someone outside of their school, despite the fact that teaching in the same city and school district could be considered a shared context. Therefore, when it comes to seeking instructional advice, there's something really critical about sharing a school context.

The importance of context is also reinforced when comparing mentors across the partner organizations. While the mentor roles varied across organizations (e.g., the university mentor holds a supervisory role for certification purposes, while the school-based mentor did not tend to have an evaluative role), they were all perceived by our sample of beginning teachers as serving in a support capacity (as is evidenced by their relatively high frequency as one of the top three supporters; see Table 4). When comparing the reasons teachers gave for listing school-based mentors with the reasons for AC or university mentors, the importance of sharing a school context and sharing experience in teachers' decisions about advice seeking becomes clear. For the AC and university mentors, reasons for their selection included expertise ($n = 3$) and the quality of their (instructional [$n = 7$], emotional [$n = 4$], or logistical [$n = 1$]) support. For example, one teacher described the expertise of a university mentor: "It feels phenomenal to hear someone come into my classroom who is a former assistant superintendent to come into my classroom and say that was really good." Notably absent were any of the homophily reasons (e.g., similar experience, similar context, similar ideals). This is particularly notable for AC program mentors who themselves had participated in the same AC program in the past and did therefore did have shared experience that the beginning teachers could appreciate.

Therefore, findings from our interviews suggest that homophily featured greatly in beginning teachers' decisions about advice seeking. While teachers felt supported by other individuals both within and outside their schools, they tended to list teacher peers and mentors in their schools whom they were like in one way or another as a part of their IPNs. In what follows, we summarize our main findings and discuss how they fit with prior research. Finally, we describe implications for supporting beginning teachers.

Discussion

Understanding both formal and informal supports for first-year teachers is critical as we work to develop their instructional practices and encourage them to stay in teaching. In this analysis we studied a group of first-year teachers participating in an AC partnership between an AC program, a university, and two urban school districts. While it is likely that first-year AC teachers' experience is different from the experience of other first-year teachers who have been more traditionally certified, such partnerships between education institutions are increasingly common in a more varied teacher certification landscape (Humphrey & Wechsler, 2007; Larson & Kyle, 2014). This particular partnership provided a number of potential supports, including training and mentoring by all of the partners. The partnership provided a rich context for understanding both formal and informal supports for first-year teachers because of the high-need context of the teachers and the numerous supports provided to them. We chose to focus on teachers' IPNs because they are an underexplored support for beginning teachers and we expected the intentionality of such networks to help us understand teachers' uptake of the provided supports. In particular, we sought to understand which individuals were in teachers' IPNs, how the IPNs changed over their first year of teaching, and the reasons the teachers gave for including those individuals in their IPNs.

One of our key findings was that beginning teachers' IPNs did constitute a support for them. In particular, their IPNs seemed to constitute a subset of their set of supporters, as was consistent with Baker-Doyle's (2012) study of four beginning teachers' networks of support. For this sample of beginning teachers, working in high-need schools in large urban districts, their IPNs mostly consisted of teacher colleagues—both peers and those assigned as mentors at their schools. In contrast, AC and university mentors, along with instructional coaches, and school leaders were listed as supporters but rarely appeared in teachers' advice networks. This seems to confirm Pitts and Spillane's (2009) hypothesis that "asking people who they have *turned to* for advice or information caused them to focus on interactions they initiated, excluding interactions in which they *received* unsolicited advice or that were organizationally prescribed" (p. 30, emphasis original). For our sample of first-year teachers, the more organizationally prescribed interactions with AC program and university mentors as well as instructional coaches and school leaders sometimes constituted supportive interactions but did not earn those individuals a place in a teacher's IPN.

A second key finding was that beginning teachers' advice networks became smaller and more school-centric over time. Teachers in our sample of 74 first-year teachers tended to narrow their advice seeking to teacher colleagues in their schools. This is consistent with Risser's (2013) study of one mathematics teacher's online network but differs from the findings of Fox and colleagues (Fox & Wilson, 2009; Fox et al., 2011), who found that teachers' networks grew over time. Risser

offered one explanation for these differing findings, related to the study methods. In Risser's study and our study, at each time point, teachers were asked about their support networks, without any prompts about their prior responses. In contrast, in the studies by Fox and colleagues (Fox & Wilson, 2009; Fox et al., 2011), the teachers were asked to draw their social networks and then add to those same drawings each subsequent time. This focus on adding to diagrams could have limited the teachers' likelihood of "pruning" individuals from their social network diagrams. The fact that teachers' IPNs became smaller and more school-centric fits with what we would have expected given that it was their first year teaching. At the beginning of the school year, teachers were still just learning about who could be trusted to provide quality support. By the end of the school year, they had more experience with colleagues, knew more about who could be trusted, and realized the importance of proximity and the shared school context. The recent study by Thomas and colleagues (2019) suggested an alternate explanation: Because these teachers taught in high-need schools with considerable accountability pressure, they might have felt constrained by factors such as high workload, colleagues' inaccessibility, and a lack of safety in admitting a need for help, which contributed to less advice seeking from colleagues.

Studies of novice teachers have suggested that when the school climate is not supportive, the teachers are more likely to seek advice from individuals outside of their schools or leave the school (e.g., Baker-Doyle, 2012). Our quantitative approach to social network analysis allowed us to study trends in IPN size and membership rather than variation at the school level. It is clear that school-level factors are central to novice teacher support and retention (Allensworth et al., 2009; Ingersoll, May, & Collins, 2019; Ingersoll & Strong, 2011), but that was not our focus in this analysis. Our qualitative analysis did surface variation, but it was at the level of individual teachers and supporters rather than at the school level. Many of the schools in which these teachers worked brought on these AC teachers because of their staffing needs, likely related, at least in part, to challenging contexts. Future studies should replicate this analysis with larger samples of first-year teachers, perhaps with different preparation and working in different contexts. With larger samples, it would be possible to more systematically attend to the school context in the analysis.

The reasons teachers gave for listing teacher colleagues in their schools were aligned with the interpretation that through their experience over the course of their first year teaching, they learned who could be trusted and realized the importance of proximity and shared school context; they were most often related to homophily. In particular, they sought advice from colleagues who shared their school context, teaching assignment, and experience. School-based mentors were listed for similar reasons as well as for the quality of the support they provided. The importance of homophily in beginning teachers' IPN selection is consistent with the literature on network selection more generally. In particular, several other studies of teachers'

advice networks have identified teaching assignment as a reason for social network selection (Frank & Zhao, 2005; Moolenaar et al., 2014; Penuel et al., 2010; Spillane et al., 2015, Spillane et al., 2012). While not surprising, the importance of a shared school context is not a common finding in the teacher network literature, likely because many studies bound networks within a school, so sharing a school context is a given. In our study, when teachers described reasons for seeking advice related to sharing a school context, it was about understanding what it is like to work with the same students and in the same school and went beyond issues of convenience or proximity, which was another reason teachers gave in this study and in other recent studies (e.g., Coburn et al., 2010; Spillane et al., 2017).

As described, our sample of first-year teachers often named people in formal leadership or supervisory roles as supporters but did not list them as members of their IPNs. This is different from previous studies of teachers' networks suggesting that colleagues in a leadership position (e.g., instructional coaches) were more likely to appear in teachers' networks (Moolenaar et al., 2014; Spillane et al., 2015; Spillane et al., 2012; Wilhelm et al., 2016). None of these studies focused specifically on first-year teachers, so it could be that willingness to seek advice from individuals in formal leadership or supervisory roles is something that teachers become more comfortable with as they spend more time at the school. Future studies should investigate this hypothesis directly.

Another unanticipated finding was that the quality of the support itself arose as a reason for why teachers sought advice or felt supported by a particular individual. In our interviews, some teachers gave detailed responses that pointed to the quality of support as the reason they gave for listing an individual. In other words, they did not name characteristics of the individual (e.g., race, gender, expertise, experience) and instead gave the support itself as the reason. For example, one teacher described one reason for listing her school-based mentor as a supporter: "the emotional support of saying what do I need, is everything OK, it looks like you're stressed out." The support itself was likely indicative of a certain type of expertise, but in this case, the emotional support was the reason she gave for identifying the mentor as a supporter. In our coding, we added reason codes for the quality of support itself. Furthermore, we made the decision to distinguish between instructional, logistical, and emotional support because of recent work suggesting that in thinking about the development of novice teachers, it is worthwhile to distinguish between subject-specific instructional support and subject-neutral logistical support (e.g., parent involvement, classroom management; Desimone et al., 2014; Luft, Roehrig, & Patterson, 2003). In our sample, the most common form of support named as a reason for listing a supporter was instructional support, which contradicts prior studies documenting more of an emphasis on logistical and emotional support for beginning teachers rather than subject-specific instructional support (Feiman-Nemser, 2001; Grossman & Thompson, 2004; Hobson, Ashby, Malderez, & Tomlinson, 2009). It is encouraging that our sample of first-year teachers valued the instructional sup-

port they were provided because there is evidence that such instructional support can have more of an impact than just emotional or logistical support on beginning teachers' instructional practice (Luft et al., 2003).

By examining change in these first-year teachers' IPNs as well as reasons for their selection of particular alters, we have come to understand more about both formal and informal supports in their first-year teaching as well as what they value in their advice seeking. One clear role that stands out is the role of the school-based mentor. The important role of mentors in supporting beginning teachers is well established in the literature (e.g., Glazerman et al., 2010; Ingersoll & Strong, 2011). However, this study reinforces their value in that it demonstrates that these are the one group of "formal" supporters who tended to appear in first-year teachers' advice networks. When the mentors were effective, mentors are connecting to these first-year teachers in ways that promote the mentors from just a supporter to an IPN alter. In that position, a sufficiently expert mentor has the potential to support the beginning teacher's instructional improvement (e.g., Lopez, Lash, Schaffner, Shields, & Wagner, 2004; Penuel et al., 2010; Sun, Frank, Penuel, & Kim, 2013; Villar & Strong, 2007).

This and other findings from this study offer implications for staffing schools to support first-year teachers' development. First, given the potential of the school-based mentors to support first-year teachers' development through their role in their IPNs, the choice of mentor and training for that mentor is critical. It is important that the individual named to the mentoring role be someone who is skilled in supporting their colleague's development both through interpersonal skills and instructional expertise, and someone to whom the beginning teacher can connect for reasons of homophily including but not limited to similar teaching assignment and similar prior experience. If the mentor is not already skilled in supporting colleagues' learning, then the mentor should receive support to learn the interpersonal skills needed to effectively mentor.

Next, and relatedly, given the first-year teachers' tendency to seek advice from school-based colleagues, it is important that there be colleagues who are strong teachers in positions (e.g., through role, location, and/or scheduling) to regularly interact with the first-year teachers. In other words, designing conditions for the development of effective IPNs requires intentional staffing, classroom locations, and scheduling (Wilhelm, Cobb, Frank, & Chen, 2018). For example, if there are two new second-grade teachers, ensuring that at least one other second-grade teacher is one of the more expert, and approachable, members of the staff would be a first step in intentionally designing informal support for those first-year teachers. It would also be important for that more expert teacher to be located in the school in a place nearby the first-year teachers and for the first-year teachers and the expert to have overlapping time for conversation. Finally, given the perceived utility of training-related homophily in teachers' identification of advice networks, long-term staffing approaches where schools are staffed by new teachers who come from the

same preparation programs, year after year, could help to build intergenerational groups of like-minded colleagues and induct first-year teachers into the profession in a way that sets them up for long-term success as teachers.

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Appendix
Support List for Interview Question

[AC program mentor]
teacher mentor (at your school)
instructional coach (at your school)
assistant principal
[university mentor]
[university] instructor
[AC teacher] peer
other