CHRISTINE LEE BAE
KATHRYN N. HAYES
DAWN M. O'CONNOR
JEFFERY C. SEITZ
RACHELLE DISTEFANO

The Diverse Faces of Teacher Leadership

A Typology and Survey Tool

ABSTRACT: The potential benefits of teacher leadership are widely acknowledged; however, the conceptualization of this construct is in need of theoretical development and analytic clarification. The purpose of this mixed methodology study was to operationalize distinct types of teacher leadership into an organized typology, based on case studies of teacher leaders in a science education project. In addition, through confirmatory factor analysis, evidence for factors representing the distinct types of teacher leadership identified in the typology was found in a general teacher leadership survey. Implications for teacher leadership research and practice are discussed.

KEYWORDS: Teacher Leadership, Typology, Science Education

INTRODUCTION

If we expect ambitious, intellectually engaged people to become teachers and remain in our public schools, we must offer them a career path that is exciting and varied over the long term, and which includes opportunities to lead among adults, not just children.

—Goldstein (2014, p. 269)

Address correspondence to Christine Lee Bae, PhD, School of Education, Department of Foundations of Education, Virginia Commonwealth University, 1015 West Main Street, P.O. Box 842020, Richmond, VA 23284-2020. E-mail: clbae@vcu.edu.

Teacher leadership creates new roles and responsibilities that are critical for both elevating the profession of teaching and advancing long-term educational improvement (Curtis, 2013; Mangin & Stoelinga, 2008; York-Barr & Duke, 2004). Teaching has been criticized as a "flat profession," in which responsibilities remain relatively unchanged, and achievements unrecognized (Curtis, 2013; Danielson, 2007; Lankford, Loeb, McEachin, Miller, & Wyckoff, 2014). Leadership opportunities for teachers address this issue by formally recognizing the talents of excellent teachers who contribute to student learning, collaboration among colleagues, and system-wide improvement (Datnow, Hubbard, & Mehan, 2002; Howe & Stubbs, 2003). Further, engaging teachers as leaders in and out of the classroom is particularly important given the current context of education reform, including the *Common Core State Standards* (CCSS) and the *Next Generation Science Standards* (NGSS) (NRC, 2013). Both research and policy documents are increasingly advocating for capitalizing on the professional capacity of teachers who are serving students inside the classroom to successfully shift curricular and instructional practices to align with new standards (Bryk, Sebring, Allensworth, Easton, & Luppescu, 2010; Coburn & Stein, 2010; Curtis, 2013; Datnow et al., 2002; Hart, 1995; Mangin & Stoelinga, 2008). Specifically in science education, leadership from teachers at all levels of the education system is critical, as principals and other administrative leaders are likely to be attending to policy initiatives and accountability measures in language arts and mathematics (Spillane, Diamond, Walker, Halverson, & Jita, 2001).

Whereas teacher leaders were once identified primarily in formal administrative roles (e.g., department chairs) or as instructional experts (e.g., mentors to new teachers), teacher leaders are now increasingly recognized as engaging in varied leadership roles across the school system, with the goal of improving instruction and shaping school culture (Curtis, 2013; Patterson & Marshall, 2014; Mangin & Stoelinga, 2008; Silva, Gimbert, & Nolan, 2000). Various titles for teacher leadership include coach or coordinator, specialist, department chair, and mentor teacher (Curtis, 2013; Mangin & Stoelinga, 2008; Wenner & Campbell, in press). However, despite the broadening conceptualization of teacher leadership, an organized typology of unique types of teacher leadership with particular characteristics, leadership responsibilities, and goals has yet to be explicated in a unifying framework (Wenner & Campbell, in press; York-Barr & Duke, 2004). Thus, the aim of this study is to empirically identify and describe distinct types of teacher leadership to contribute to an understanding of how leadership functions are differentiated along teachers' characteristics, roles, means, and targets of influence. In addition to providing a much-needed framework for the empirical study of teacher

leadership, such a typology can serve to frame and substantiate decisions regarding various teacher leadership positions that exist in an education system, as well as professional development and other trainings aimed to support teacher leadership enactment and practice.

CONCEPTUALIZING TEACHER LEADERSHIP FOR EMPIRICAL STUDY

Taken together, studies examining teacher leadership clearly show that teachers are assuming formal and informal leadership roles in numerous domains (Curtis, 2013; Darling-Hammond, Bullmaster, & Cobb, 1995; Lieberman & Miller, 2005). One domain highlights the role of teacher leaders as pedagogical experts. Here, teachers serve as models to promote best teaching practices, such as aligning standardized achievement norms with meaningful learning goals to guide their instruction (Darling-Hammond et al., 1995; Mangin & Stoelinga, 2008; Spillane et al., 2001). A second way that teacher leadership is highlighted is through their role in professional learning contexts, in which they promote ongoing discourse, collaboration, and accountability among colleagues to improve educational practices (Curtis, 2013; Hart, 1995; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). Teacher leaders are also recognized in decision-making and administrative contexts regarding educational policy, such as student discipline policies and curriculum adoption committees (Acker-Hocevar & Touchton, 1999). Finally, teacher leadership roles identified in the literature include teachers as researchers (systematic inquiry regarding instructional practice), and as community liaisons (promoting collaboration with families and community members) (Paulu & Winters, 1998).

Across literature noting these domains, teacher leadership is characterized as a conglomeration of roles within and beyond the classroom that range from formal to informal, instructional to administrative, and team based to organizational (Patterson & Marshall, 2014; York-Barr & Duke, 2004). A variety of teacher leader traits, characteristics, approaches, and outcomes emerge from the literature; however, each study often focuses on some elements of teacher leadership and not others. Thus, the field is in need of a typology that can provide a unifying framework for future research in teacher leadership. Furthermore, although the potential and desired effects of teacher leadership are widely cited (Gonzales & Lambert, 2014), empirical evidence regarding the benefits of teacher leadership is mixed. It is possible that the mixed results are in part due to the unspecified conceptualization of teacher leadership, as described in the discussion that follows.

From qualitative studies, there is growing evidence indicating positive outcomes of teacher leadership. Results from case studies show that serving in teacher leadership positions is linked to growth in management skills, awareness of new instructional practices, and increased motivation for site and district-level improvement (Gonzales & Lambert, 2014). Teacher leaders also reported satisfaction with their influence on colleagues' practices (being a resource for dealing with difficult students, planning lessons) (Coburn & Stein, 2010; Ryan, 2006). Finally, teacher leaders reported having an impact on school-wide issues such as improving curriculum and participating in organizational decision-making (Spillane & Kim, 2012).

These positive outcomes are encouraging, yet the way teacher leadership has been conceptualized varies from study to study, making it difficult to synthesize findings to build a coherent body of evidence. For example, in several studies, teacher leadership was examined based on a dichotomous formal versus informal teacher leadership distinction (Paulu & Winters, 1998; Talbert & McLaughlin, 1994). In other studies, teacher leadership was examined in the context of school-based decision-making in which teachers continued to serve in the classroom (Smylie, Conley, & Marks, 2002), or in the context of reform in which teachers serve in management and policy work (Acker-Hocevar & Touchton, 1999; Harris et al., 2013). Overall, the concept of teacher leadership is widely used, but the conceptualizations of teacher leadership are varied and often vague. While findings from qualitative studies contribute to our understanding of teacher leadership as a multidimensional construct, the exact nature of these dimensions remains elusive.

Similar to the diverse ways in which teacher leadership is conceptualized in the qualitative studies reviewed above, quantitative tools used to measure teacher leadership show divergent approaches to examining this construct. For example, the 33-item teacher leadership survey used by Smylie, Lazarus, and Brownlee-Conyers (1996) assessed five broad categories including participative decision-making, individual autonomy, organizational learning opportunities, instructional improvement, and student outcomes. Thus, this survey focused on the context, opportunities for, and outcomes of, teacher leadership. In other cases, teacher leadership has been measured as a single, general construct. As an example, in Leithwood and Jantzi's (1999) study, teacher leadership was indicated by the average rating of three Likert-scale items (e.g., "Individual teachers providing leadership on an informal basis," p. 702). Finally, the Readiness for Teacher Leadership survey (Katzenmeyer & Moller, 2009) consists of 25 items that examine a range of characteristics related to teacher leadership, ranging from willingness to spend time helping new colleagues, to attitudes toward collaborating with university faculty.
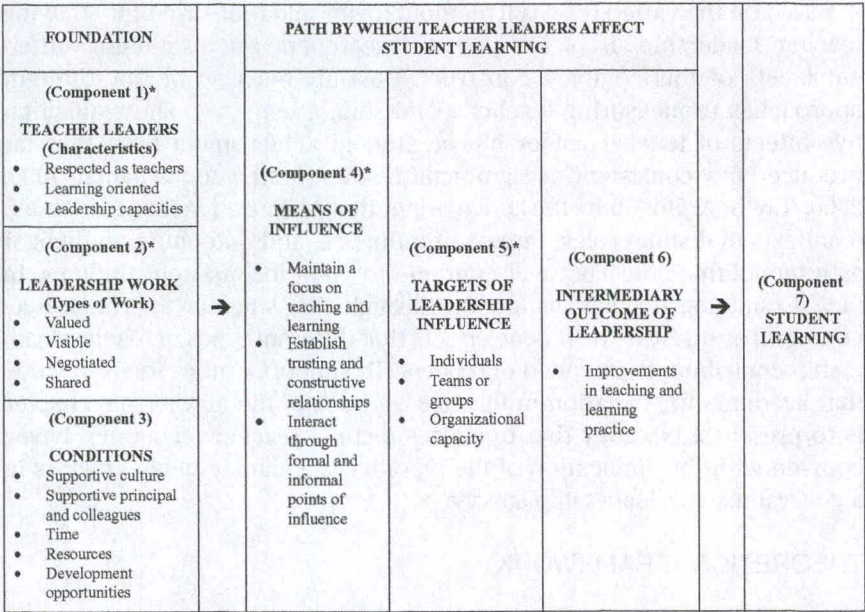
Based on the varied research methodologies and tools used for studying teacher leadership, it is likely that researchers are examining different facets of this complex construct. Possibly because of the different approaches to measuring teacher leadership, attempts to show quantitative effects of teacher leadership on student achievement have thus far produced few consistent or significant results (Leithwood & Jantzi, 1999, 2000; Taylor & Bogotch, 1994). We argue that because teacher leadership manifests in distinct roles, targets of influence, and outcomes, studying it as a monolithic construct will continue to yield inconsistent findings. In fact, examining teacher leadership through this singular approach may confound or disguise the unique effects that different types of teacher leadership contribute to intended outcomes. To support a more focused study that accounts for variation in teacher leadership, the aim of this chapter is to present a typology that organizes distinct teacher leadership types, coupled with the application of the typology to examine unique factors in a general teacher leadership survey.

THEORETICAL FRAMEWORK

This study draws from the theoretical framework proposed by York-Barr and Duke (2004) to operationalize the unique types of teacher leadership in regard to distinguishable characteristics, roles, pathways of leadership work, and targets of influence (Figure 1). In their model, York-Barr and Duke (2004) propose a theory of action that consists of seven components including the foundation of teacher leadership (components 1–3), the paths by which teacher leaders affect student learning (components 4 and 5), intermediary outcomes of leadership (component 6), and the ultimate desired effects on student learning (component 7). Based on the aims of this study, components 1, 2, 4, and 5 of the theoretical framework were used to analyze data and frame the findings regarding the teacher leadership typology.

Characteristics of teacher leaders (component 1) include being respected by colleagues and assuming a learning orientation in their work (York-Barr & Duke, 2004). Types of leadership work (component 2) refer to the nature of the leadership responsibilities; that is, work that is valued by colleagues, negotiated among multiple stakeholders, and/or visible in the school. Component 4 (means of influence) refers to the informal and formal pathways through which teacher leaders have influence, ranging from teaching and learning processes in the classroom to points of influence regarding policy and organizational decisions. Finally, component 5 (targets of leadership influence) refers to the persons or groups served by teacher leaders, ranging from the development of individual colleagues and students, to

FOUNDATION	PATH BY WHICH TEACHER LEADERS AFFECT STUDENT LEARNING			
(Component 1)* **TEACHER LEADERS (Characteristics)** • Respected as teachers • Learning oriented • Leadership capacities	**(Component 4)*** **MEANS OF INFLUENCE**			
(Component 2)* **LEADERSHIP WORK (Types of Work)** • Valued • Visible • Negotiated • Shared →	• Maintain a focus on teaching and learning • Establish trusting and constructive relationships • Interact through formal and informal points of influence	**(Component 5)*** **TARGETS OF LEADERSHIP INFLUENCE** • Individuals • Teams or groups • Organizational capacity	**(Component 6)** **INTERMEDIARY OUTCOME OF LEADERSHIP** • Improvements in teaching and learning practice →	**(Component 7) STUDENT LEARNING**
(Component 3) **CONDITIONS** • Supportive culture • Supportive principal and colleagues • Time • Resources • Development opportunities				

Indicates components of York-Barr and Duke's (2004) theoretical framework of teacher leadership that are examined in this study

Figure 1. Theoretical Framework of Teacher Leadership (adapted from York-Barr & Duke, 2004, p. 289)

school-wide improvement in teaching and learning (York-Barr & Duke, 2004). In this study, we examine how each of these four components manifests in different ways across unique types of teacher leaders.

PURPOSE AND RESEARCH QUESTIONS

The purpose of this study was to develop a typology of teacher leadership that organizes unique types of teacher leadership according to teacher characteristics, leadership work, and pathways and targets of leadership influence. Informed by the qualitative findings regarding the differentiated types of teacher leadership, we conducted a confirmatory factor analysis (CFA) of the Readiness for Teacher Leadership survey (Katzenmeyer & Moller, 2009) to present empirical evidence for our typology. Specifically, the CFA tested whether a model with distinct factors, representing the types of teacher leadership identified in the typology, fits the data. This study was guided by the following research questions: (1) What are

the different types of teacher leadership that emerge from analysis of qualitative data (in regard to characteristics, work, pathways and targets of influence)? and (2) Are there distinct factors underlying a teacher leadership survey that are related to different teacher leadership types identified in the typology?

METHODOLOGY

This study was part of a larger, multiyear NSF-funded middle school science professional development project, working with districts that served a diverse student population (minority population ranging from 59.6% to 97.8%) with varying levels of socioeconomic status (percent Free Reduced Lunch ranging from 21.5% to 84.3%). Demographic information of the participating districts is presented in Table 1. The overarching goal of the project was to build capacity for inquiry-based and, later, NGSS-aligned reforms among middle schools in eight urban districts. A core component of the project focused on facilitating teacher leadership through content and pedagogical professional development, leadership workshops, and district leadership institutes.

For the qualitative component of the study, we used a multiple case study design, comparing differences and similarities in teacher characteristics, leadership work, and means and targets of influence among nine teacher leaders (Yin, 2013). For the quantitative component of the study, we obtained and analyzed survey data from a larger sample ($N = 178$) of teacher leaders to examine if the different types of teacher leaders identified in our typology appear as distinct factors in the teacher leadership survey.

Table 1. Demographics of Participating Districts for the 2012–13 School Year

District (% of teacher leaders in study)	% FRL	% ELL	% Minority	Largest Ethnic Group
District A (8.7%)	84.3	43.0	97.8	Hispanic or Latino
District B (12.7%)	21.5	18.1	83.83	Asian
District C (20.2%)	68.1	30.9	93.1	Hispanic or Latino
District D (8.7%)	45.1	22.6	59.6	Hispanic or Latino
District E (11.6%)	65.2	23.8	89.4	Hispanic or Latino
District F (10.4%)	61.3	27.0	89.4	Hispanic or Latino
District G (8.7%)	44.3	29.4	77.3	Hispanic or Latino
District H (5.8%)	44.8	26.6	92.5	Hispanic or Latino

PARTICIPANTS

Following the scholarly tradition of using participant interviews with leaders to understand different forms of leadership (Cosner, 2009), we conducted in-depth interviews with participating teacher leaders over the course of the 2014–15 school year, as well as conducting observations of teacher leaders' classrooms and professional development sessions. Interviews lasted for approximately 45 minutes to 1 hour. The nine interview candidates were selected using a maximum variation selection strategy (Patton, 1990) to represent a range of teacher leaders. Sampling was based on selection criteria that included maximum range of experience (years teaching), and type of credential (single or multiple subject) (Table 2). Teacher names are pseudonyms.

Finally, the Readiness for Teacher Leadership survey (Katzenmeyer & Moller, 2009) was administered during district leadership institutes in the 2013–14 and 2014–15 school years. A total of 178 responses were collected from middle school science teachers (65% Caucasian, 24.9% Asian, 5.8% Hispanic, 1.7% African American, and 1.7% other; 31.2% male and 68.8% female) across the eight participating districts. These teacher leaders served in distinct leadership capacities throughout the school year, such as modeling science lessons that illustrated shifts toward NGSS practices, facilitating district-based lesson study teams, and/or working with administrators to develop district science action plans.

MEASURES

Teacher Science Education Leadership Interview Protocol

We developed a 13-item semi-structured interview protocol (Appendix A). Major sections of the interview protocol include (1) the context of schools and districts, (2) nature of teacher leadership including roles and activities, and (3) science education supports and barriers in their district.

Assessing Your Readiness for Teacher Leadership Survey (Katzenmeyer & Moller, 2009)

This 25-item measure was designed to assess the degree to which teachers' attitudes, values, and beliefs align with those related to teacher leadership work cited in the literature. We selected this survey because it measured a range of specific characteristics related to teacher leadership work, whereas other surveys focused on factors such as outcomes of teacher leadership (e.g., Smylie et al., 1996) or were not conducive

Table 2. Background Information of Teachers Interviewed

Name	# Total Years of Teaching	Teaching Credential	Subjects Taught	Grade(s) Teaching	Teacher Leadership Roles
Julie	18 years	Multiple Subject	Math and Science	6	Lesson study facilitator, Board member for head start initiative, Instructional aid in district
Lance	20+ years	Single Subject (Life Science)	Math and Science	6	District liaison, Lesson study facilitator Professional learning leader
Bret	20+ years	Single Subject (Physical Science)	Math and Science	8	District PD codeveloper and planner, Instructional innovator, Lesson study facilitator
Greg	4 years	Single Subject (Life Science)	Science	7	District liaison, District PD codeveloper and planner, Instructional innovator, Lesson study facilitator
Lauren	10 years	Single Subject (Physical Science)	Science	8	District liaison, District PD codeveloper and planner, Lesson study facilitator, Science department head, Serves on campus Common Core teams
Shelly	10 years	Multiple Subject	Science Specialist	K-6	After-school tech program teacher, Lesson study participant, Report card committee member
Lindsey	10 years	Multiple Subject Foundation Level General Science (FLGS) Credential	Math and Science	6	District liaison, District PD codeveloper and planner, FLGS co-instructor, Instructional Innovator, Lesson study facilitator
Kara	10 years	Single Subject (Life Science)	Science	7	District liaison, District PD codeveloper and planner, Lesson study participant
Stephanie	13 years	Single Subject (Earth Science)	Science	6	District liaison, District PD codeveloper and planner
Ciara	27 years	Multiple Subject, two supplements for science, one supplement for math	Math and Science	8	Instructional Innovator, District Liaison, codeveloping pacing guide for middle school science curriculum

to a factor analysis due to small number and/or general wording of items (e.g., Leithwood & Jantzi, 1999). Content validity was established through examination of items by a panel of experts (Katzenmeyer & Moller, 2009). Past studies showed high internal reliability, with Cronbach's alpha ranging from 0.83 to 0.93 (Salazar, 2010). In this study, survey items were adapted slightly to target leadership capacity specific to science education (e.g., "Focus on student learning" changed to "Focus on student learning in science") (Appendix B). Teachers rated items on a 5-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Cronbach's alpha was .90, showing evidence of high internal reliability.

Corroborating Evidence

While transcripts from teacher leaders' interviews were the primary source of data analyzed in this study, additional data sources were obtained and analyzed from the nine teacher leaders to corroborate findings with the interview results. Corroborating evidence included detailed field notes from professional development meetings and classroom observations, including observations of science teaching with a follow-up interview regarding teachers' instructional practices, and audio recordings and observation notes at district leadership meetings and site and district professional development meetings. This evidence was used to verify the findings from teachers' interviews regarding leadership roles.

QUALITATIVE ANALYSIS

In order to address the first research question, interview transcripts were coded using the Dedoose qualitative software (Dedoose, 2015) through a hybrid approach that incorporated deductive coding using theory-based a priori codes and inductive coding driven by the data (Crabtree & Miller, 1999; Huberman & Miles, 2002). The initial analysis consisted of deductive coding based on existing theory, providing empirical grounding for emergent theory (Huberman & Miles, 2002). Specifically, we used the four components from York-Barr and Duke's (2004) framework of teacher leadership to generate an initial list of a priori codes (i.e., characteristics of teacher leaders, leadership work, means of influence, and targets of influence). The a priori codes were further broken down into more specific a priori subcodes, based on the descriptors of the four components from the theoretical framework of teacher leadership (e.g., 'respected as teachers' was placed as an a priori subcode of the broader a priori component 1 'characteristics of teacher leaders' code).

Following the initial deductive coding process, new information regarding characteristics, leadership work, and means and targets of influence was open-coded, resulting in the emergent codes (Glaser, 1992; Glaser & Strauss, 1967). Examples of emergent codes include "content expertise," "novice teachers," and "reform and policy interest" (component 1; characteristics of leaders); "curriculum work" and "facilitating learning of adult learners" (component 2; leadership work); "systems approach" and "classroom-based leadership" (component 3; means of influence); and "students," "principals," and "teacher colleagues" (component 4; targets of influence). Both a priori and emergent codes were examined for redundancies, intersections, and hierarchical relationships (Crabtree & Miller, 1999).

The data were further analyzed by comparing and connecting codes across interviews to identify patterns in the data (Crabtree & Miller, 1999). It became clear that certain codes were clustering among particular teacher leaders. The ways in which the codes accumulated for particular teacher leaders revealed the unique features of leadership that helped to differentiate the three types of teacher leadership presented in this chapter. Thus, the teacher leadership types emerged from seeing how a priori and inductive codes related to leadership characteristics, work, pathways, and targets of influence clustered within particular teachers. These coded data were grouped by common themes that lead to the identification and development of descriptions for each of the teacher leadership types (Glaser & Strauss, 1967).

Corroborating evidence was used as supplementary data to verify findings from the interview data. The classroom data (observations and follow-up interviews) and field notes from professional development meetings were examined to check for alternative interpretations and non-examples of findings from the teacher leadership interview data. For example, if a teacher claimed to lead professional development, this was checked across other data to determine whether and to what extent he or she led professional development. The findings from the interviews and corroborating evidence were triangulated (Denzin, 1978), and converging findings from these different data sources were used to finalize the different types of teacher leadership presented in this study. Finally, the results of interview data was continually revisited and scrutinized with the project coaches and director who worked closely with the teachers in professional development (Crabtree & Miller, 1999; Glaser, 2002).

QUANTITATIVE ANALYSIS

A CFA was conducted on the Readiness for Teacher Leadership (Katzenmeyer & Moller, 2009) survey with maximum likelihood robust (MLR) estimation in MPlus6. The CFA tested whether the three types of

teacher leadership identified through the qualitative analysis were sup-
ported by the factor structure of a survey intended to measure a range of
leadership characteristics related to teacher leadership work. The first and
second authors of this chapter independently categorized the survey items
according to the typology of three types of teacher leaders (instructional
innovator, professional learning leader, and administrative teacher leader)
as well as a general factor for items that were not specific to a teacher
leader type. The items categorized independently were compared and any
disagreements were resolved. Based on the item categorization, the fol-
lowing four-factor model was tested: (1) general teacher leadership (items
1, 7, 13, 16, and 25), (2) instructional innovator (items 3, 4, 5, 8, 10, 17, 22,
and 24), (3) professional learning leader (items 2, 6, 9, 12, 14, 15, 20, 21, and
23), and (4) administrative teacher leader (items 11, 18, and 19). Of note,
each of the four teacher leadership constructs in the survey consists of at
least three survey items, meeting the three indicator minimum requirement
for representing a latent factor in structural equation modeling (Kline,
2005). Geomin-rotated factors were examined to determine the strength of
each item's factor loading. The fit of the four-factor model to the data was
determined by a set of absolute, relative, and comparative goodness-of-fit
(GOF) indices for ML estimation, including the root-mean square error of
approximation (RMSEA), standardized root-mean square residual (SRMR),
comparative fit index (CFI), and Tucker-Lewis Index (TLI). The cutoff
values recommended by Hu and Bentler (1998) were used to determine fit:
RMSEA ≤ 0.06, CFI/TLI ≥ 0.90, and SRMR ≤ 0.08.

RESULTS

The results from this study describe the following three types of teacher
leadership that emerged from the analysis: (1) instructional innovator, (2)
professional learning (PL) leader, and (3) administrative teacher leader
based on the clustering of a priori and emergent codes among particular
teachers (summarized in Table 3). Of note, the descriptions associated
with each type of teacher leadership are not mutually exclusive. Although
findings showed that each teacher represented primarily one leadership
type, in some cases, teachers exhibited characteristics, roles, targets, and/
or means of influence that were associated with another type of leadership.

INSTRUCTIONAL INNOVATOR: LEADING FROM THE CLASSROOM

The first type of teacher leadership that emerged from the analysis is
the instructional innovator. This teacher leadership profile aligns with

Table 3. Summary of Three Types of Teacher Leadership

Teacher Leadership Type	Characteristics (Component 1)	Leadership Work and Means of Influence (Components 2 and 4)	Targets of Influence (Component 5)
Instructional Innovator	– Extensive years of classroom teaching experience – Strong content and pedagogical content knowledge – Interest in direct work in the classroom and with students	– Classroom-based modeling of reform-aligned practices – Mentoring more novice teachers in their instructional practices – Guiding students in learning of science through student-centered activities – Contributing to curriculum development	– Students – More immediate colleagues (e.g., teachers and administrators within their school site)
Professional Learning Leader	– Can include more novice teachers – Holds relational and facilitation skills – Understands needs of adult learners – Assuming responsibility for group as well as individual learning	– Facilitating professional learning groups (e.g., lesson study) – Planning and delivering professional development – Translating theories and standards into classroom-relevant applications – Building networks for professional learning	– Immediate and more distant colleagues (e.g., teachers from other school sites and/or districts) – School and/or district practices and networks of professional learning
Administrative Teacher Leader	– Assumes responsibility for group as well as individual learning – Interested in educational reform and policy decisions	– Providing classroom teachers' perspective in leadership meetings – Being involved in educational policy decision-making – Building networks among internal and external (e.g., university partners) stakeholders	– Administrators at the site and district levels – Key external partners (e.g., university faculty, county office of education) – Organizational capacities and culture of school and/or district

principles of formative leadership in which leaders have significant years of experience and are considered experts in a given domain (Ash & Persall, 2000; Curtis, 2013). Bret, Ciara, and Kara displayed characteristics of instructional innovators; they served in the classroom for 10 to over 20 years, and exercised leadership through their expertise in teaching and learning. Instructional innovators' primary targets of influence were students and immediate colleagues. However, their influence often extended beyond the classroom as they offered their classroom practices as a centerpiece of study for instructional learning, reflection, and improvement.

Experts in Science Teaching and Learning

Expertise is defined as various forms of interrelated domain-specific knowledge and set of skills that have been accumulated over time (Anderson, 1993; Ericsson, Krampe, & Tesch-Römer, 1993). In the context of teaching, expertise is demonstrated in teachers' abilities to make effective moment-to-moment pedagogical decisions that attend to the multiple demands of dynamic classroom events. Analysis of Bret, Ciara, and Kara's interviews revealed such expertise, including a deep knowledge of science content, instructional strategies, and students who were organized around complex representations of classroom scenarios. This was corroborated in the classroom observations and interviews of these teacher leaders enacting inquiry-based science lessons during the school year.

As an example, teaching expertise was evident in Bret's interviews and classroom observations, as he facilitated a classroom culture that supported students' learning of science through authentic practices. He explained that he purposefully engaged students in hands-on science activities at the start of the school year, to teach them that knowledge in science is developed through active sense-making processes:

> To "see how we do business" is what I tell students. Most science textbooks and most science teachers begin the school year talking about, "this is the scientific method and these are the practices of science." That bores me so I know that must bore the students. But it's only boring without a context.

Specifically, Bret described beginning the year with a unit on liquid density, in which students explored the properties of different liquids, engaged in a class discussion to generate investigable questions, and explored the questions by gathering qualitative and quantitative data through observations of different liquids. As Bret continued,

This unit builds a context. So then we can talk about what we're doing—"Oh yes we're making comparisons, yes we're asking questions." To do those things [scientific practices] in a vacuum is very difficult. To do them with a context like this works beautifully. It really does help them learn science as science is done.

As students worked in groups, Bret expertly guided their inquiry through approaches that illustrated a balance between appropriate scaffolding and opportunities for student autonomy. For example, when a group of students were perplexed over inconsistent density calculations, he provided open-ended guidance rather than explicit directions:

> I didn't tell them that their numbers were off. I told them, "Let's just try to do one of the measurements again." I don't want to be the absolute authority who says, "That's right, that's wrong" because then what would be the point of them investigating on their own—if they can get the answers from me.

By scaffolding scientific investigations, Bret supported the development of students' habits of minds as scientists.

Instructional innovators' expertise of student learning also supported their ability to efficiently retrieve and apply pedagogical heuristics and principles to meet the diverse learning needs of their students (Peterson & Clark, 1978; Shavelson & Stern, 1981). As Ciara described, good science teaching necessitates a deep understanding of how each student learns, and this requires multiple pedagogical strategies that provide different points of entry into students' thinking; "for good science teaching I think you need to have a knowledgeable teacher. . . . You have to look at what are the big ideas? What are the misconceptions? So you really have to understand how the students are thinking and their reasoning."

Instructional Model for Integrating Best Practices

As a function of their extensive years in teaching, the instructional innovators in our study had undergone several waves of educational reform. They therefore held a more historical perspective on education reform, and provided insights regarding the influence of education policies on daily instructional practices. Bret spoke of the educational shifts spurred by the No Child Left Behind Act (2002) "where science became largely about teaching vocabulary . . . it took the practices out of science. It was not about doing those things, it was just about defining them." He then provided an opinion on the potential of current education reforms: "That's

why I'm much in favor of the NGSS. Students who are engaged [in the science practices] are largely learning on their own and from each other." Bret's perspective illustrates how instructional innovators' experience allows them to take an informed position on the role that new standards will play in their classroom.

Analysis of the interviews also highlighted how a repertoire of class-room strategies and an established classroom culture enabled instructional innovators to use their classroom as a platform for demonstrating best practices. Ciara, Kara, and Bret regularly hosted formal and informal classroom observations for various stakeholders throughout the school year, including demonstration lessons to members of their lesson team (to observe a research lesson in action), colleagues (to model the implementation of a new activity or strategy), and researchers (to record classroom videos). For example, Kara invited her site administrator to observe a science lesson in her classroom that explicitly incorporated CCSS and NGSS-aligned strategies for student discourse. Instructional innovators challenged the common practice of teaching in isolation by making their teaching public for a wide range of stakeholders.

Direct Classroom and Student Impact

Instructional innovators were interested in leadership roles that involved teaching and interactions with students, in contrast to other forms of administrative or policy-related teacher leadership. Bret, in particular, expressed prioritizing time in the classroom over other leadership activities such as leading professional development:

> I'm very jealous of my time with students. . . . I don't like anything that takes me out of school. My team members know I am a notoriously terrible corre-spondent because I just get involved in teaching. So during the school year I'm not very good at professional development stuff. It's hard for me to allocate my resources to that.

For the instructional innovators, leadership work that extended outside of the classroom still remained student- and/or instruction-centered, such as participating in the development of standards-aligned curricula. Both Bret and Kara spoke of their experiences on large-scale curriculum proj-ects. Kara served on a cross-disciplinary project with science faculty to develop science lessons aligned to the Benchmarks for Science Literacy (AAAS; 1993) and National Science Education Standards (NRC; 1996) and Bret worked on countywide curriculum improvement efforts to develop hands-on lessons across subjects. By drawing on their craft knowledge,

instructional innovators served as critical contributors to standards-aligned curricula (Ball & Cohen, 1996).

PROFESSIONAL LEARNING (PL) LEADER: STEWARDS OF COLLABORATION

Whereas the classroom served as the primary venue from which instructional innovators led, the PL teacher leaders who emerged from interviews (Greg, Lance, Jillian, and Stephanie) exhibited leadership at the level of school sites (grade-level teams, staff department meetings), districts (district-wide science PD workshops), or beyond (workshops at national conferences). This was also corroborated with evidence from audio recordings and field notes of lesson study meetings. The PL leaders' target of influence was their colleagues, both local and more distant.

Facilitation of Adult Learners

One characteristic that emerged from PL leaders' interviews was that they understood the unique needs of adults in collegial learning contexts (Sherrill, 1999). Professional learning leaders spoke in detail about the multiple beliefs, perspectives, and experiences that their colleagues brought to professional learning contexts. For example, Lance shared the importance of allowing teachers to shape and be accountable for the direction of their learning: "They [teachers] don't like to be told what to do. And so I've always felt that the best leadership style is to sit and listen to people in a group . . . that they [teachers] come up with the ideas, and that they take ownership of it." Here Lance shared the importance of facilitating adult groups to promote ownership of new pedagogies and, in turn, transfer of their learning to practice. He also notes that teachers find value in experiential learning around topics that could be directly applied to their classroom (Trotter, 2006). This insight into the dynamics of collaborative learning among adults bolstered his leadership approach, as the literature shows that adult learners in particular have a need for autonomy and the use of experience as a resource in their professional learning (Stoll et al., 2006).

In addition, PL leaders were attuned to teachers' major concerns regarding new reforms. They discussed how communities of practice could serve as a place for ongoing understanding of, and informed response to, the changing conditions in education. Greg, who served on a district leadership team, spoke of science teachers' wariness regarding the implementation of the NGSS, which would require many science teachers to learn new content: "I think just like anything, if there is a change, there's going to be a little push back, because you get so comfortable having taught one way

for many years. I think it's just that initial insecurity about having to do something different." Based on this insight, he shared the importance of setting focused and manageable goals in the district science action plan: "We discussed a one-unit thing . . . baby steps . . . something that isn't overwhelming." Greg's awareness of his colleagues' apprehensions allowed him to facilitate a discussion that accounted for his colleagues' concerns while addressing changing policies in science education.

Relational Skills to Promote Growth in Professional Learning Groups

Proximity to colleagues has been documented to be critical for de-privatizing teaching and improving student outcomes (Fullan, 1993). PL leaders were committed to fostering a culture of collegiality and building collaboration opportunities shown to be critical for deep shifts in teacher instructional practice (Stoll et al., 2006). To achieve this, PL leaders acknowledged the importance of establishing relationships and trust: "It's not about just the role you do. There's a lot of personal relationships and other factors that come into this" (Lauren). This understanding of professional learning as an inherently social process aided PL leaders in developing the relational components of their professional learning groups.

Professional learning leaders also discussed that the goal of collaboration was to progress beyond a simple division of tasks, and toward teachers collectively developing their professional knowledge and skills. As Lance noted regarding his lesson study team:

> It used to be that collaboration meant that we shared the work. So you do A, I do B, you do C . . . we each have a distinct component that you don't talk about with other people. And then it kind of evolved . . . I mean, we all have to have input. We all have to have ownership . . . the idea of collaboration is that it takes more than one set of eyes.

Here Lance underscores the importance of moving collaboration from superficial exchanges of assistance, toward shared responsibilities among teachers to improve students' learning (Hord, 2004; Stoll et al., 2006).

Bridging Reform Ideas and Classroom Practices

Professional learning leaders also supported the process of turning their group's shared learning into actionable steps to improve teaching and learning. Julie demonstrated this in her description of teacher leadership: "A teacher leader is somebody who brings ideas and helps other teachers incorporate them." For example, Kara shared how she supported teachers

in making connections between their instruction and new standards by examining curriculum with her district science leadership team to support shifts toward the NGSS across primary and secondary school years. In such ways, PL leaders play important roles in supporting the process of translating policies into classroom-relevant applications.

When discussing their roles in collaborative contexts, PL leaders discussed serving as mediators between various stakeholders, such as administrators who tended to focus on accountability measures and available resources, reform professionals who tended to push for fidelity to the program, and in-service teachers who may alter reforms in ways that reinforce their existing practices (Coburn, 2003; Spillane & Kim, 2012). Greg talked about serving as a "bridge" to communicate to administrators the importance of allowing teachers time to experiment with new pedagogical strategies as they entered the NGSS awareness phase, rather than expecting science teachers to immediately implement the new standards. Similarly, Lance spoke of the importance for teacher leaders serving as a "conduit where information goes both ways" between teachers and administrators.

Leadership Among More Novice Teachers

A noteworthy finding was that the PL leaders in this study included more novice teachers. Analysis of the interviews showed that, in some cases, new teachers were hesitant to take on leadership positions associated with expertise, such as the instructional innovator: "I still consider myself a newbie as a teacher, so for me to be a TOSA [teacher on special assignment] and coach other teachers, I just don't feel like I personally have even fully shifted to NGSS to even be confident enough to teach or coach other teachers (Greg)." Furthermore, an incentive for PL teachers' participation in a professional learning leadership role was the opportunities to learn from other teachers. Stephanie shared how co-planning and delivering district-based professional development challenged her to grow professionally: "It's a new challenge. I feel like as a teacher I don't want to get stuck doing the same thing all the time. . . . [I] learn from other teachers about what they're doing. Which I think is good for me (Stephanie)." Thus, PL leaders included a range of novices to veteran teachers interested in learning from colleagues in the context of their leadership roles.

ADMINISTRATIVE TEACHER LEADER

In the third type of leadership, teachers took on 'shared governance' (Hart, 1995) or 'distributive leadership' (Spillane & Kim, 2012) roles as administrative teacher leaders. Teachers in our study who demonstrated these

characteristics include Lindsey, Lauren, and Stephanie; Kara also exhibited some of the administrative teacher leader characteristics in addition to her PL leader role. The administrative teacher leaders in this study acted as agents of change by serving in roles outside of the classroom, and influencing site and district policies and reform initiatives (Darling-Hammond et al., 1995; Spillane & Kim, 2012). These roles enabled them to bring the experiences and voices of classroom teachers to systems-level decisions.

Systems-Level Perspective and Interest in Education Policy

Administrative teacher leaders demonstrated an interest in building partnerships to increase teachers' influence at the organizational level (Darling-Hammond et al., 1995; Smylie et al., 2002). They frequently spoke of the impact of district and school-based initiatives beyond the implications to their own classroom (Acker-Hocevar & Touchton, 1999; Lieberman & Miller, 2005; Smylie et al., 1996). For example, administrative teacher leaders discussed keeping abreast of new policies influencing organizational decisions (Acker-Hocevar & Touchton, 1999). In the interviews, as well as analysis of the field notes from district leadership meetings, they spoke of taking initiative to disseminate up-to-date information among colleagues. Both Lindsey and Lauren attended national science education conferences to obtain information regarding NGSS, which they shared in their department and district professional development meetings. In addition, based on her district's decision to adopt the NGSS integrated model, Lauren sought out information regarding the credentialing implications for her colleagues teaching middle school science; "I've done a lot of researching myself. I have the credential I need. But I've done a lot of research, just because I'm interested in this and I want to be able to help people on my site."

Administrative teacher leaders also spoke of the importance of participating in policy and organizational decisions, such as attending board of education meetings, teachers union meetings, and leadership institutes. For instance, acknowledging the challenges science teachers face due to competing language arts and mathematics initiatives, Lindsey described advocating for science-specific needs in leadership meetings with administrators including "more professional development and collaboration time, time off to observe in other classroom, and financial support for consumable materials."

Advocates of Shared Leadership

Administrative teacher leaders showed a strong commitment to shifting traditional top-down leadership structures toward a participatory

decision-making culture that include formal teacher leadership positions (Darling-Hammond et al., 1995; Katzenmeyer & Moller, 2009; Spillane & Kim, 2012). As an example, Lindsey successfully advocated for building teacher leader capacity in her district by recommending that her district's teacher leaders facilitate the district-based professional learning work-shops in lieu of hiring external consultants. She argued that the teachers within the district understood the needs of the students and families they served, and leveraging this internal capacity could overcome "the lack of credibility that exists when an outside facilitator comes in and tells us how to incorporate Common Core literacy integration in science."

In addition, administrative teacher leaders often spoke of challenging the status quo to create channels of communication in a traditionally hier-archical system (Leithwood & Janzi, 1999; Silva et al., 2000). This approach is in contrast to the common model in which "teachers and administrators work in parallel universes" (Katzenmeyer & Moller, 2009, pp. 4–5). For example, Lindsey invited administrators to observe her science classroom, not with the purpose of having her instruction evaluated, but rather as a coresearcher, "with an eye for what the students are learning . . . not with an 'evaluation of teacher' perspective." Lindsey reasoned that creat-ing opportunities for administrators to observe firsthand the resources and structural supports that are required to support high-quality science classrooms would facilitate the allocation of necessary funds toward sci-ence education: "If we had more participation like that, administrators would understand what we're doing, which could address issues over how much time and money can be allotted to PD and materials." In contrast to instructional innovators who used their classrooms to support deeper understanding of best teaching practices, Lindsey used her classroom to build a shared leadership commitment to science education between teachers and administrators, by flattening hierarchies and engaging her principal as a coresearcher.

TESTING THE TYPOLOGY OF TEACHER LEADERSHIP

The teacher leader survey data were fit to a four-factor model that included the three types of teacher leadership identified in the typology and a fourth, general teacher leadership factor. The GOF indices from the CFA showed that the four-factor model was a good fit to the data ($\chi^2 = 417.933$, $df = 268$, $p < 0.001$, RMSEA = 0.06, CFI = 0.91, TLI = 0.89, SRMR = 0.06). Post hoc modifications to the model included allowing residuals between items to correlate. Specifically, the error terms for items 5 and 8, 10 and 17, and 9 and 23 were correlated. Residuals were allowed to correlate when there was a high level of similarity between items (e.g., items 5 and 8 both refer

to helping colleagues with their teaching) (Kline, 2005). Figure 2 presents the standardized factor loadings of the 25 items on the four-factor teacher leadership model. All standardized factor loadings ranged between 0.41 and 0.71, meeting the criteria of a minimum factor loading of 0.30 to retain valid items (Matsunaga, 2010). The following labels were assigned to the
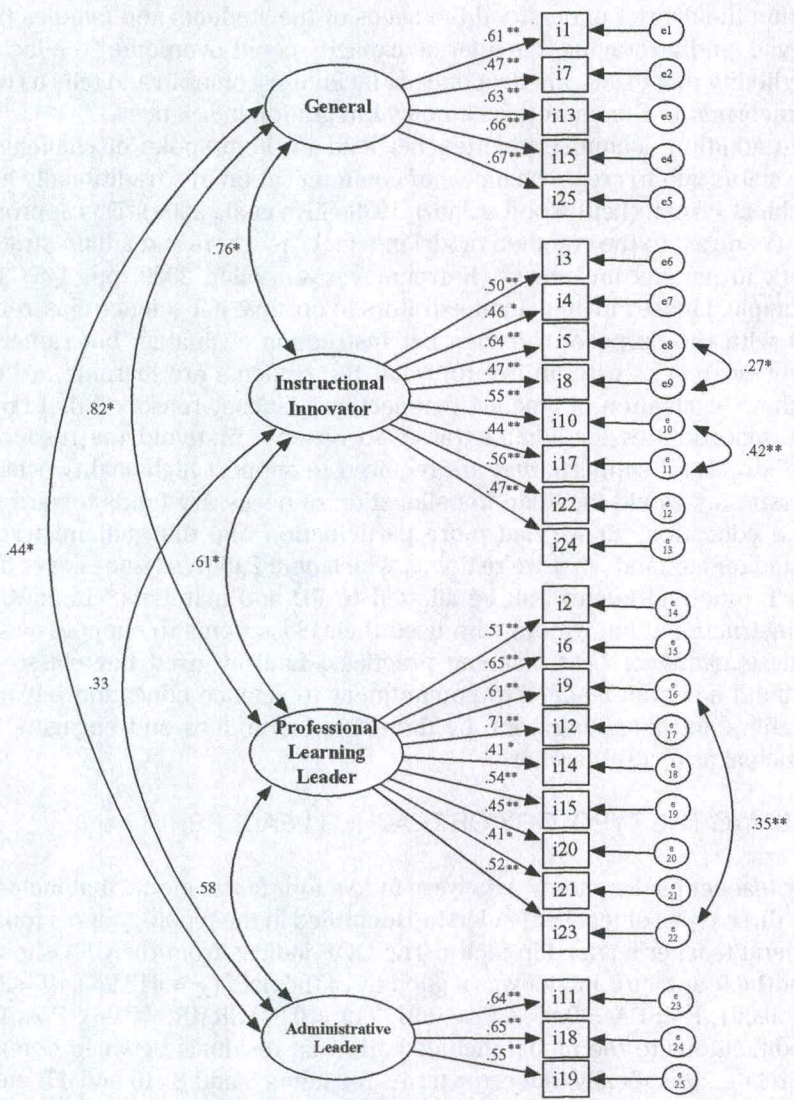

Figure 2. CFA standardized factor loadings of items for a four-factor teacher leadership model. $*p < 0.01$, $**p < 0.001$.

four factors: (i) general teacher leadership, (ii) instructional innovator, (iii) professional learning leader, and (iv) administrative leader. These results provide evidence for our typology, as our hypothesized model of the different types of teacher leadership fits the data collected in this study. Furthermore, the results provide empirical support for using the survey to assess readiness for teacher leadership along four distinct factors (instructional innovator, PL leader, administrative leader, general).

DISCUSSION

Schools across the United States are undergoing educational reform aimed to support an increasingly diverse population of learners. Active involvement from teacher leaders is critical for supporting the deep shifts in teaching and learning advocated by these reforms. Although the pluralistic nature of teacher leadership in practice is recognized, the existing body of research currently does not delineate different types of teacher leadership into an organized framework to guide future research in this emerging area of professional practice (Wenner & Campbell, in press; York-Barr & Duke, 2004). Moreover, the common treatment of teacher leadership as a monolithic construct has posed challenges for empirically examining the outcomes of teacher leadership.

To address this gap in the literature, we present a typology that explicates three types of teacher leadership, each with their respective characteristics and interests, roles, pathways, and targets of influence. This three-pronged typology provides a clearer conceptualization to support future work that moves beyond treating teacher leadership as an umbrella term, and toward empirically investigating how different types of teacher leadership support the desired improvements in teaching and learning. These three types include teachers who are empowered to serve as instructional models for their peers (instructional innovator), facilitate a culture of professional learning (PL leader), and lead school and district-wide improvement efforts (administrative teacher leader).

We tested the typology using the Readiness for Teacher Leadership survey (Katzenmeyer & Moller, 2009), which demonstrated construct validity for the three types of teacher leadership presented in our typology. Examining teachers' readiness for leadership within each of the distinct factors presented in our CFA, rather than as a single, general factor, will support efforts toward a differentiated study of the nature and outcomes of teacher leadership. Of note, our mixed-methods approach using interview data, corroborating evidence, and survey responses (in contrast to sole use of qualitative interview data) to develop the teacher leadership

typology is rare. Converging findings from both qualitative and quantitative results provide robust evidence for the three types of teacher leadership presented in this chapter.

The role of the instructional innovator may be particularly critical for the realization of reform goals as they model shifts required by education reforms, and support the development of a clear vision of what reformed classrooms look like among various stakeholders. Furthermore, instructional innovators play a critical role in de-privatizing the practice of teaching by creating a culture in which teachers and administrators are critically examining the effectiveness of one another's practices. Professional learning teacher leaders serve as agents to create and build a culture of authentic collaboration and continuous professional learning; they facilitate a positive and trusting group dynamic while also challenging their team to critically examine each other's thinking, assumptions, and practice to promote growth that would be unachievable without collaboration (Sherrill, 1999; Stoll et al., 2006). Findings from our study of PL leaders showed that driven, novice teachers may be well suited for, and more willing to take on facilitative leadership positions in the context of collaborative settings in which they are not expected to have the expertise of a veteran teacher. Finally, the administrative teacher leader can play a critical role in developing shared leadership in educational organizations. Research on effective school leadership underscores the need to recognize diverse sources of leadership that go beyond the role of the school principal, and argue for school leadership as a shared enterprise, in contrast to the traditional managerial perspective that places leaders in a hierarchical system (Gonzales & Lambert, 2014; Spillane & Kim, 2012). The administrative teacher leader can support improvement in teaching and learning when provided opportunities to bring the knowledge of teachers to systems-level decision-making processes.

Our findings also have important implications for policies and practice in regard to formalizing distinct teacher leadership roles. To begin with, the results suggest the importance of considering a wider pool of teachers to select candidates for particular leadership roles. For instance, more novice teachers may be ideally positioned to serve in collaborative contexts. This is an alternative approach to the common practice of solely designating leadership to experienced, veteran teachers (Curtis, 2013; York-Barr & Duke, 2004). In addition, our findings regarding instructional innovators align with the literature that shows that many teachers are not interested in taking up administrative leadership positions (Howe & Stubbs, 2003; Katzenmeyer & Moller, 2009), but still may be interested in leadership beyond their regular teaching responsibilities. Currently, teacher leadership roles outside of administrative positions are often

not formally recognized (Katzenmeyer & Moller, 2009), and while some researchers have suggested that establishing formal roles may not be necessary for teacher leadership (e.g., Hanuscin, Rebello, & Sinha, 2012), other studies have shown that there are a host of challenges and barriers that prevent teachers from leading effectively when leadership responsibilities are not formalized (Patterson & Marshall, 2014; Spillane et al., 2001). For instance, when teacher leaders do not have formally recognized roles and resources, they frequently use their planning time to complete clerical duties (Ovando, 1996; Patterson & Marshall, 2014; Spillane et al., 2001).

In regard to limitations and future areas of study, it is important to note that this study was conducted among middle school science teachers. Due to variations in leadership opportunities and resources across subject areas (e.g., Spillane et al., 2001), and the mixed findings in the literature regarding leadership role formalization (Wenner & Campbell, in press; York-Barr & Duke, 2004), future research is needed to examine the typology in this study in different contexts and disciplines. Additionally, future research is needed to establish additional evidence of reliability and validity of the teacher leadership survey using scores obtained from a larger population. Future studies are also needed to replicate the four-factor model presented in this study, given the exploratory nature of the post hoc model modifications.

In summary, we present a typology and survey tool that explicates distinct types of teacher leadership to support ongoing improvement within and beyond the classroom. Formalizing these leadership positions may help combat the trend of teachers who leave the profession because of limited constructive feedback on their practice, lack of time to think creatively and collaborate with colleagues, and little opportunity to take on additional responsibilities and grow as professionals (Goldstein, 2014; Ingersoll & Strong, 2011). Recognizing the three teacher leadership pathways presented in this study allows teachers who have leadership proclivity at varied levels of the education system to fill unique roles ideal for them, which have meaningful impacts on students, colleagues, and/or educational organizations. Finally, the typology provides a mechanism by which researchers can delineate between types of teacher leadership and thus account for how variation in teacher leadership characteristics and roles may influence desired outcomes toward educational improvement.

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Christine Lee Bae is an assistant professor in the School of Education, Department of Foundations of Education at Virginia Commonwealth University. She received her PhD in Educational Psychology from the University of Florida, and completed her postdoctoral research on a multiyear NSF middle school science education partnership grant at California State University East Bay. Her research focuses on examining factors and processes that impact teaching and learning in K–12 and higher education settings.

Kathryn N. Hayes Kathryn Hayes is an assistant professor in the Department of Educational Leadership at California State University East Bay. After teaching science in public elementary schools for ten years, she completed the requirements for her PhD in science education and school organization and educational policy at University of California. Her research draws on sociocultural and organizational theory to demonstrate the leadership and organizational capacity needed to support education reform at urban schools. In a related line of inquiry, she studies the nature of teacher change in relationship to organizational structures.

Dawn M. O'Connor is a science partnership director at the Alameda County Office of Education and the director for the California Science Project-East Bay at California State University East Bay. She received her master's degree in Educational Leadership from California State University San Jose. Her work is focused on building teacher leadership capacity and creating partnerships for the improvement of the teaching and learning of science.

Jeffery C. Seitz is a professor in the College of Science, Department of Earth and Environmental Sciences, at California State University East Bay. He is the principal investigator for the NSF Integrated Middle School (IMSS) Partnership and also involved in the East Bay Science Project. In both projects, he provides professional

development to districts in the San Francisco Bay area seeking to strengthen their science programs and science instruction consistent with evidence-based practices.

Rachelle DiStefano is a director for the Center for Science Education Research in the Institute for Science Technology Engineering and Mathematics (STEM) Education at California State University East Bay. She is a co-principal investigator for NSF Integrated Middle School (IMSS) Partnership, and principal investigator for the NSF/DRK12 Next Generation Alliance for Science Educators Toolkit (Next Gen ASET). She began her work in education in 1990 as a new Oakland Unified School District high school teacher, and later served as a County Office of Education Director of Professional Development Programs supporting teachers and administrators in 18 districts.

APPENDIX A

TEACHER LEADERSHIP INTERVIEW PROTOCOL

I. INTRODUCTION

1. I'd like to start by learning more about you. Can you tell me about how many years you have been teaching and what other positions in education you have held in the past?
2. In what ways have you been involved in professional development prior to IMSS?

II. CONTEXT OF SCHOOLS AND DISTRICTS

I'd like to ask about the local context in which you are serving as a teacher leader.

1. Please describe the students and families you serve.
   Probe: get information about general demographics of student body, community
   Probe: information about school tier (e.g., Tier I, II, or III, Program Improvement (PI) school, eligible for Title 1 funds).
2. Please describe the educators here. For example: What issues are really important to them? How do they work together? How would you describe the teaching and administrative cultures?
   Probe: population, culture, norms, especially regarding professional collaboration, teacher autonomy, and leadership.
   Probe: teaching community and administration
3. What are the national, state, or local policies or priorities here in the last two years or so?
   Probe: standards, assessments, new curricula, etc.
   Probe: NGSS awareness and implementation plan—who is taking lead on the action plans for integrated versus domain-specific?
   Probe: What are some district policies, initiatives, programs that are important to be aware of?

III. TEACHER LEADERSHIP

4. How would you define teacher leadership?

5. What roles have you served in as a teacher leader (formally and/or informally)?

    Probe: How did you get involved in taking on these roles?

    Probe: What are some specific ways you are serving in these roles (formally or informally)?

    Probe: Is leadership expressed differently in your formal versus informal roles?

    Probe: Instructional versus administrative leadership roles.

6. How are opportunities at your site and/or district created for you (and others) to lead?

7. What are some of your long-term and short-term goals as a teacher leader?

    Probe: Ask about the goals associated with specific roles/activities mentioned above.

8. What inspires and/or encourages you to take on the teacher leadership roles?

    Probe: Ask about any successes.

    Probe: Through what means do you advocate for changes (e.g., processes, people)?

    Probe: What are the important factors that support your ability to lead among your peers?

9. What are some challenges, if any, that you have observed or experienced in your teacher leadership role?

10. What conditions support and/or hinder teacher leadership?

    Probe: Who would you say are the critical leaders/individuals who will support teacher leadership (e.g., principals, district administrators)?

    Probe: How are leadership roles clarified among teacher leaders, principals, etc.?

11. What do you want to learn more about as a teacher leader? Are there any supports you can think of which would be beneficial for supporting your principal in support teacher leaders?

12. What are some of the effects (positive and/or negative) of teacher leadership on student outcomes?

13. What advice would you give to other teachers who are interested in taking up teacher leadership positions?

Appendix B. Teacher Leadership Readiness Survey (Katzenmeyer & Moller, 2009)

General Teacher Leadership	1. My work as a teacher leader is both meaningful and important.
	7. It is important to me to have the respect of the administrators and other teachers in my district.
	13. I can continue to serve as a science classroom teacher and become a teacher leader in my school and/or district.
	16. My work contributes to the overall success of our school and district science program.
	25. I want to work in an environment where I am recognized and valued as a professional.
	3. Teachers should be recognized for trying new teaching strategies whether they succeed or fail.
	4. Teachers should decide on the best methods of instruction for meeting educational goals set by policy-making groups (e.g., district boards and state departments).
	5. I am willing to observe and provide feedback to other science teachers.
	8. I would be willing to help a colleague who is having difficulty with his/her teaching.
	10. I would give my time to help new science teachers in my school or district.
Instructional Innovator	17. Mentoring new teachers is part of my responsibility as a professional teacher
	22. I have knowledge and skills that can help students be successful in science.
	24. I am very effective in working with almost all of my science students.
	2. Individual teachers should be able to influence how other teachers think about, plan for, and conduct their work with students.
	6. I would like to spend time discussing my values and beliefs about science teaching with other teachers and colleagues.
	9. I can see the points of view of my colleagues, students, and students' parents.
	12. Teachers working collaboratively should be able to influence practice in their schools and districts.
	14. Cooperating with my colleagues is more important than competing with them.
	15. I would give my time to help plan professional development activities at my school and/or district.
Professional Learning Leader	20. I value the time spent working with my colleagues on science curriculum and instructional matters.
	21. I am very effective in working with almost all of my colleagues.
	23. I recognize and value points of view that are different from mine.
	11. I facilitate the work of students in my science classroom and of colleagues in meetings at my school and district.
Administrative Teacher Leader	18. Middle school science teachers and university faculty can mutually benefit from working together.
	19. I would be willing to give my time to participate in making decisions about such things as instructional materials, allocation of resources, student assignments, and/or organizations of the school day

Note: Item numbers correspond to the order of items on the original *Readiness for Teacher Leadership* survey (Katzenmeyer & Moller, 2009)