

The Role of Social Context in Novice Teacher Development

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Overview

- Background
- Person-Organization Fit and Commitment, Retention
- Social Networks and Instructional Practices
- Preparation Experiences and Instructional Practices

Thank You

- I want to thank Morgaen and Shaun for the invitation to present this lecture

Background: Glazerman et al. (2010)

- ❑ Large-scale, 3-year experimental study by Glazerman and colleagues at Mathematica (2010) on high-intensity novice teacher induction programs
- ❑ 1,009 beginning teachers in grades K-6; 418 elementary schools; 17 urban school districts; each school assigned to treatment or control
- ❑ Treatment (high-intensity induction): full-time, trained mentors; formative teacher assessments; classroom observations by mentor; released time
- ❑ Control (low-intensity induction): mentoring from a full-time teacher; less common: mentor training, formative teacher assessment, classroom observations by mentor; released time
- ❑ Ten of 17 districts offered one year of treatment; 7 districts offered two years of treatment

Background: Glazerman et al. (2010)

Findings

- ❑ No differences between treatment and control groups with regard to teacher retention or literacy instruction
- ❑ For the 7 two-year districts, effects of treatment on mathematics and reading achievement test scores (no effect for the 10 one-year districts)

Background: Garet, Wayne, et al. (2011)

- Large-scale, 2-year experimental study by Garet, Wayne, et al. (2011) at AIR on professional development for middle school mathematics teachers
- In Year 1, the study featured 179 teachers at 80 middle schools in 12 districts; each school assigned to treatment or control
- In Year 2, the study featured 92 teachers at 39 middle schools in 6 districts; each school assigned to treatment or control
- The schools serve high percentages of a) racial/ethnic minority students and b) students eligible for free/reduced price lunch
- Two respected PD providers: America's Choice and Pearson Achievement Solutions; PD was consistent with recommendations from research
 - Summer institutes
 - Series of one-day follow-up seminars
 - In-school instructional coaching
- Of the 92 teachers in the study in Year 2, 51 had been in the study for two years (23 treatment and 28 control)

Background: Garet, Wayne, et al. (2011)

Findings

- No significant effects of PD on overall teacher knowledge or either of the teacher knowledge subscale scores (i.e., mathematical content knowledge, mathematical knowledge for teaching)
- No significant effects of PD on overall student achievement on NWRA Rational Number Test (RNT) or either of the RNT subscale scores: (i.e., fractions and decimals, ratios and proportion)
- Some effects of PD on math instructional practice at the end of Year 1
 - Teacher elicits student thinking (significant effect)
 - Teacher uses representations (nearly a significant effect)

Your Interpretations?

- What's Going On In These Studies?
 - The studies are well-designed and well-funded
 - The researchers have reputations for conducting rigorous research
 - The interventions are designed to be consistent with recommendations from the scholarly literature

Focus on Social Context

Three Ways of Conceptualizing and Measuring Teachers' Social Context

- From perspective of focal teacher (focus on this today)
- By collecting data on teachers' social networks (focus on this today)
- By collecting data on interactions between teacher characteristics and their opportunity-to-learn (time permitting)

Collegial Climate and Novices' Intent to Remain Teaching (Pogodzinski, Youngs, & Frank, 2013)

Purpose of Study

- Examine teacher-level associations between measures of novice teachers' perceptions of the collegial climate in their schools and their intended career decisions
- Focus on three aspects of collegial climate:
 - Degree of professional fit
 - Level of relational trust
 - Degree of collective responsibility

Acknowledgements

- Co-Author, Ben Pogodzinski, Wayne State University
- Co-PI and co-author: Ken Frank, Michigan State University
- Funding from the Carnegie Corporation of New York

Background

- Factors That Affect Teacher Job Attitudes and Turnover
 - Teacher characteristics, student characteristics, administrator support, economic factors (Boyd et al., 2011; Guarino, Santibanez, & Daley, 2007; Ladd, 2011)
 - Indeterminate findings from large-scale studies of mentoring (Glazerman et al., 2010; Kapadia, Coca, & Easton, 2007; Smith & Ingersoll, 2004)
- Novice Teachers' Interactions with Colleagues are Potentially Important
 - Through interactions, norms/expectations are communicated to novices
 - Through interactions, networks are established through which novices may access resources
 - Opportunities to collaborate with colleagues associated with retention (Kapadia et al., 2007; Smith & Ingersoll, 2004)
- Novices Evaluate the Collegial Climate in Their Schools Through:
 - Formal interactions (e.g., mentoring)
 - Informal interactions (e.g., based on shared professional networks)

Measures, Data Collection

- Collegial Climate Measures
 - Perceptions of professional fit
 - Perceptions of teacher-teacher trust relations
 - Perceptions of collective responsibility
- District Sample
 - 11 districts in Indiana and Michigan
 - medium to large (most served 10,000 to 20,000 students)
 - medium to high levels of poverty (most served 30% to 60% free lunch)
- Surveys
 - Early career teachers (ECTs) in years 1-3 who taught in core content areas at elementary and middle school levels
 - Formal mentors and other school-based colleagues who worked with the ECTs and were identified by the ECTs as being helpful resources

Variables of Interest

Variable	Description	Mean
Intent	Spring 2008 (mean response to intent to teach the following year and intent to teach over next five years: 1 = <i>strongly disagree</i> ; 4 = <i>strongly agree</i>)	3.264
Prior intent	Fall 2007 (mean response to intent to teach the following year and intent to teach over next five years: 1 = <i>strongly disagree</i> ; 4 = <i>strongly agree</i>)	3.337
Professional fit	Perceived degree of fit (composite variable created by taking mean response across six items) (1 = <i>strongly disagree</i> ; 4 = <i>strongly agree</i>)	3.256
Relational trust	Perceived degree of teacher-teacher trust (composite variable created by taking mean response across four items) (1 = <i>strongly disagree</i> ; 4 = <i>strongly agree</i>)	3.167
Collective responsibility	Perceived degree of collective responsibility (composite variable created by taking mean response across six items) (proportion of teachers: 1 = <i>none</i> ; 5 = <i>all</i>)	3.692

Models

Unconditional Model

$$\text{Intent}_{ijt} = \gamma_{00} + r_{0j} + e_{ij} \quad (1).$$

Teacher-Level Analysis

$$\text{Intent}_{ijt} = \gamma_{00} + \mathbf{\gamma}'_{10} \text{Collegial climate}_{ijt-1} + \mathbf{\gamma}'_{20} \text{Teacher attributes}_{ij} \\ + \mathbf{\gamma}'_{01} \text{School attributes}_{0j} + r_{0j} + e_{ij} \quad (2).$$

Group-Level Analysis

$$\text{Intent}_{ijt} = \gamma_{00} + \mathbf{\gamma}'_{10} \text{Collegial climate}_{ijt-1} + \mathbf{\gamma}'_{20} \text{Teacher attributes}_{ij} \\ + \mathbf{\gamma}'_{01} \text{Collegial climate means}_{0jt-1} + \gamma_{02} \text{Total responses}_{0j} \\ + \gamma_{03} \text{Response rate}_{0j} + \mathbf{\gamma}'_{04} \text{School attributes}_{0j} + r_{0j} + e_{ij} \quad (3).$$

Prior Intent (Prior Commitment)

$$\text{Intent}_{ijt} = \gamma_{00} + \gamma_{10} \text{Prior intent}_{ijt-1} + \mathbf{\gamma}'_{20} \text{Collegial climate}_{ijt-1} \\ + \mathbf{\gamma}'_{30} \text{Teacher attributes}_{ij} + \mathbf{\gamma}'_{01} \text{Collegial climate means}_{0jt-1} \\ + \gamma_{02} \text{Total responses}_{0j} + \gamma_{03} \text{Response rate}_{0j} \\ + \mathbf{\gamma}'_{04} \text{School attributes}_{0j} + r_{0j} + e_{ij} \quad (4).$$

Findings

	(1)	(2)	(3)	(4)	(5)
Intercept	3.289*** (0.084)	3.412*** (0.238)	0.615 (1.029)	0.731 (1.004)	0.809 (0.938)
Prior intent				0.708*** (0.091)	0.779*** (0.081)
Fit		.0447** (0.208)	0.575*** (0.206)	0.321** (0.159)	0.384*** (0.125)
Trust		0.141 (0.208)	0.128 (0.203)	0.129 (0.155)	
Collective		0.412** (0.173)	0.360** (0.169)	0.114 (0.135)	
Fit mean			0.273 (0.365)	0.333 (0.354)	0.364 (0.351)
Trust mean			0.219 (0.288)	0.214 (0.276)	0.375* (0.222)
Collective mean			0.313 (0.234)	0.219 (0.227)	

Implications, Extensions

Implications

- ❑ Importance of professional fit for novice teachers
- ❑ Importance of collective responsibility for novices
- ❑ Perceptions of fit and collective responsibility are shaped by formal and informal interactions with colleagues

Extensions

- ❑ Grogan (2011) used same dataset to examine associations between ECT retention and a) person-organization (P-O) fit and b) person-group fit
- ❑ Player, Youngs, Perrone, and Grogan (under review) used data from the 2011-12 Schools and Staffing Survey (SASS) to investigate associations between teacher retention and a) P-O fit and b) person-job fit
- ❑ Youngs, Pogodzinski, Grogan, and Perrone (2015) reviewed research on P-O fit and employee commitment and retention; and theorized ways in which P-O fit may affect instruction

How Early Career Elementary Teachers' Social Networks Affect Ambitious Mathematics Instruction

- ❑ Co-PIs: Ken Frank and Kristen Bieda, Michigan State University; Serena Salloum, Ball State University
- ❑ Funding from the National Science Foundation and the William T. Grant Foundation
- ❑ In 2016-17, we are in the 3rd year of this 3-year study

Focus of Study

Research Question

- How 120 to 150 early career elementary teachers (ECTs) draw on and are affected by their school-based social networks as they respond to multiple institutional pressures in teaching mathematics (e.g., Common Core, teacher evaluation reform)

Focus on Ambitious Mathematics Instruction

- Mathematics instruction that addresses procedural fluency and conceptual understanding contributes to student learning (Hiebert & Grouws, 2007; National Mathematics Advisory Panel, 2008).

Role of Mathematical Knowledge for Teaching (MKT)

- Strong MKT enables ECTs to integrate mathematical content knowledge with local knowledge of students and curriculum
- Research documents relationships between teachers' MKT and a) high-quality mathematics teaching and b) student mathematics learning (Hill, Rowan, & Ball, 2005; Jacob, Kane, Rogoff, & Staiger, 2009).

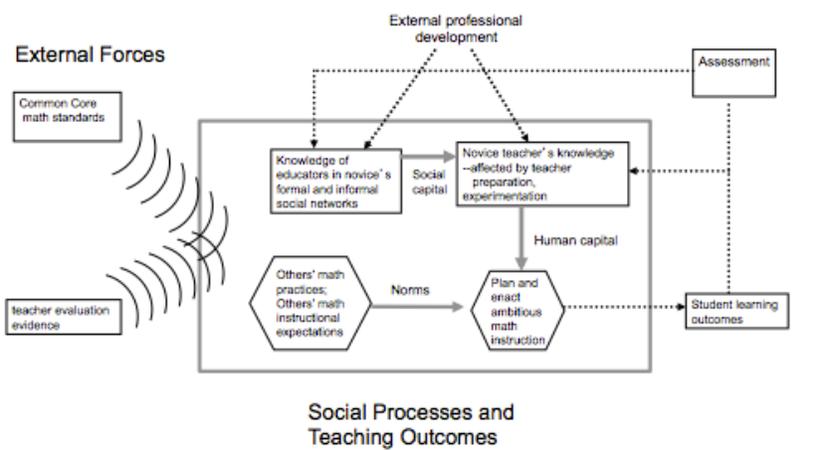
Sources of MKT Necessary to Support Ambitious Math Instruction

- Many ECTs initially acquire MKT during pre-service preparation
- They must continue to develop MKT after they become teachers of record

Question: What are potential sources of MKT for ECTs?

- Trial and error
- External professional development
- Role of school-based social networks
- Egocentric social networks vs. sociometric social networks

Factors That Influence Early Career Teachers' Knowledge and Mathematics Instruction



Hypotheses

Planning

- School-based norms regarding the Common Core Mathematics Standards will have a significant effect on ECTs' planning of mathematics instruction

Enactment

- An early career teacher's MKT will influence her enactment of ambitious mathematics instruction that is consistent with the Common Core and that addresses both procedural fluency and conceptual understanding
- When social network members (SNM) a) have high MKT and b) enact ambitious math instruction, early career teacher-SNM interactions are more likely to lead to the ECTs' enactment of ambitious math instruction
- When SNMs have low MKT or don't share their MKT, ECTs will be less likely to enact ambitious mathematics instruction
- When school-based norms emphasize less demanding mathematics instruction, ECTs will be less likely to enact ambitious math instruction

Design: Sampling

District Sample

- Eight medium-sized school districts in IN, IL, and MI
- Most of these districts serve more than 10,000 students K-12
- In most of these districts, more than 30% of students are eligible for free/reduced lunch

Early Career Teacher Sample

- Approximately 120 teachers in grades K-5 in 2015-16 who were in their first four (4) years of full-time teaching

Design: Data Collection – ECT Surveys

- Each ECT completed 3 surveys in 2015-16

ECT survey (fall 2015, spring 2016)

- items on planning math instruction, teaching math lessons
- items on interactions with mentors, teacher colleagues, math instructional coaches, principals
- items on efficacy re: teaching math (H1-H2), fixed vs. growth mindset (H3)
- items on mastery and performance goal orientations (H4-H5)
- items on general teaching efficacy (H6), collective efficacy (H7)

MKT survey (winter 2016)

- items on ways to represent content in number and operations and typical student difficulties in this area

Design: Observations of ECTs

- Each ECT participated in 4 classroom observations in 2015-16 when they were teaching mathematics; 2 in fall and 2 in spring
- We are using the TRU Math (Teaching for Robust Understanding in Mathematics) classroom observation instrument (Schoenfeld & Floden, 2014) to evaluate the following:
 - The extent to which the mathematics in an observed lesson is focused and coherent
 - The extent to which students engage in high cognitive demand mathematical tasks
 - The extent to which students have opportunities to develop and explain mathematical arguments
 - The extent to which the teacher elicits student thinking and addresses misunderstandings

Design: Surveys of Social Network Members

- Each social network member completed two surveys in 2015-16
 - social network members include formal mentors, close teacher colleagues, and instructional coaches

Social network member survey (winter 2016)

- items on planning math instruction, teaching math lessons OR items on expectations for teachers' math instruction
- items on efficacy re: teaching math (H1-H2), fixed vs. growth mindset (H3)
- items on mastery and performance goal orientations (H4-H5)
- items on general teaching efficacy (H6), collective efficacy (H7)

MKT survey (winter 2016)

- items on ways to represent content in number and operations and typical student difficulties in this area

Design

Analytic Strategies

- We are using multivariate regression and HLM to study key outcomes as a function of several independent variables, including those representing social network effects
- The main outcomes are a) ECTs' planning of ambitious math instruction and b) their enactment of such instruction
- The degree to which early career teacher j in school s enacts math instruction that features focused instructional dialogue with students on intended math learning goals and correct interpretations of students' math thinking will be modeled as:

$$\begin{aligned} \text{TEACH}(\text{spr. 2016})_{js} = & \beta_1 \text{Mathematical Knowledge for Teaching}_{js} \\ & + \beta_2 \text{Colleagues' Mathematical Knowledge for Teaching}_{js} \\ & + \beta_3 \text{Colleagues' Math Instructional Practices (norms)}_{js} \\ & + \beta_4 \text{PLAN}(\text{fall 2015})_{js} + \beta_5 \text{TEACH}(\text{fall 2015})_{js} \\ & + B'z_{js} + q_s + e_{js} \end{aligned} \quad (1)$$

Design

Comments on Model

- The term "Colleagues' Mathematics Instructional Practices_{js}" can be used to represent colleagues' math instruction or colleagues' math expectations for the early career teacher (ECT) in different model specifications.
- These models are being estimated with both fixed and random school effects (the latter using HLM), and tests are being used to determine the justifiability of assumptions embedded in the random effects models. School effects can also be captured by a set of school characteristics.
- A model similar to (1) can be used to estimate effects of the MKT and math instruction (expectations) of an ECT's mentor (or math coach or principal) on her enactment of ambitious math instruction.
- A model similar to (1) can be used to estimate effects of various factors on an ECT's *planning* of ambitious math instruction.
- We will include a term representing the interaction of colleagues' MKT and their math instruction, as per our hypothesis that both may be required to facilitate an ECT's ambitious math instruction

Challenges

- ❑ Indiana's decision to drop the Common Core in spring 2014
- ❑ Recruitment of early teachers, concerns about video recordings of instruction
- ❑ 1st-year teachers vs. 2nd-, 3rd-, and 4th-year teachers
- ❑ Number of observations of each novice teacher
- ❑ Egocentric social networks vs. sociometric social networks

The Development of Ambitious Instruction in Elementary Mathematics and English Language Arts

- ❑ Co-PIs: Julie Cohen (UVA), Robert Berry (UVA), Dorothea Anagnostopoulos (UConn), Tutita Casa (UConn), Corey Drake (MSU), Spyros Konstantopoulos (MSU),
- ❑ Funders: Spencer Foundation; National Science Foundation

Research on Teacher Preparation

- Many studies have examined the design, practices, and short-term outcomes of teacher education
- Small-scale studies
 - Experiences in individual courses and student teaching
 - Changes in student teachers' beliefs or instructional practices
- Large-scale studies
 - NYC Pathways Study examined how preparation experiences are related to teacher effectiveness in first two years (Boyd et al., 2009)
 - Several studies have compared teacher education programs in the same state with regard to graduates' effects on student achievement (e.g., Goldhaber, Liddle, & Theobald, 2013; Henry et al., 2014; Koedel, Parsons, Podgursky, & Ehlert, 2015)

Current Study

- Teacher preparation experiences and a more proximal outcome: instructional practices in mathematics and reading/language arts
- Elementary preparation programs at 6 universities
 - 3 research I institutions
 - 3 large public institutions
- 150 elementary teaching candidates
 - Multiple preparation programs – varied contexts
 - Individual characteristics – beliefs and knowledge
 - Learning opportunities in university courses and student teaching
 - Resources, expectations in schools
 - Enactment of ambitious instruction – as full-time 1st- and 2nd-year teachers

Research Design: Year 1 (2015-16)

Surveys of Elementary Teaching Candidates

- Elementary teaching candidate survey about characteristics of and opportunity-to-learn in methods courses and student teaching
- Mathematical knowledge for teaching (MKT) survey
- Teachers' Knowledge of Reading and Reading Practices (TKRRP) Survey for grades K-3
- Survey of English Language Arts (ELA) Pedagogical Content Knowledge (PCK) for grades 4-5

Surveys of Cooperating Teachers and Instructional Supervisors

Interviews with Methods Instructors and Teacher Education Program Directors

Research Design: Years 2 and 3 (2016-17 and 2017-18)

1st-(2nd-)Year Teachers

- Survey about resources and norms/expectations in their schools
- Mathematical knowledge for teaching (MKT) survey
- Teachers' Knowledge of Reading and Reading Practices (TKRRP) Survey for grades K-3 (2017-18 only)
- Survey of English Language Arts (ELA) Pedagogical Content Knowledge (PCK) for grades 4-5 (2017-18 only)

Observations of 1st-(2nd-)Year Teachers

- 3 observations during mathematics instruction (winter, spring)
- 3 observations during reading/language arts instruction (winter, spring)

Surveys of Formal Mentors, Instructional Coaches, Principals

Key Characteristics of Our Study

- ❑ Focus on two subjects: mathematics and reading/language arts
- ❑ Focus on elementary teachers: they strongly influence students' academic and life outcomes
- ❑ Use of PLATO and M-Scan (reliable, valid classroom observation instruments)
- ❑ Inclusion of research I institutions and large public teaching institutions

Challenges

- ❑ Selection effects
- ❑ Teacher attrition (from teaching or from study)
- ❑ Variation among study participants in content knowledge
- ❑ Modifying PLATO and M-Scan for use in early grades (K-2)
- ❑ Program graduates will not all be teaching in VA, CT, MI
- ❑ Video recording lessons vs. live observations

References

- Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S., & Wyckoff, J. (2011). The influence of school administrators on teacher retention decisions. *American Educational Research Journal, 48*(2), 303-333.
- Boyd, D.J., Grossman, P.L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis, 31*(4), 416-440.
- Garet, M.S., Wayne, A.J., Stancavage, F., Taylor, J., Eaton, M., Walters, K., Song, M., Brown, S., Hurlburt, S., Zhu, P., Sepanik, S., Doolittle, F., & Warner, E. (2011). *Middle School Mathematics Professional Development Impact Study: Findings After the Second Year of Implementation*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.
- Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M., Johnson, A., Grider, M., Jacobus, M., & Ali, M. (2010). *Impacts of Comprehensive Teacher Induction: Final Results from a Randomized Controlled Study*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.
- Goldhaber, D., Liddle, S., & Theobald, R. (2013). The gateway to the profession: Assessing teacher preparation programs based on student achievement. *Economics of Education Review, 34*, 29-44.
- Grogan, E.L. (2011). *Finding the fit: Measurement and assessment of drivers of teacher mobility and attrition*. Unpublished doctoral dissertation, Michigan State University.
- Guarino, C., Santibanez, L., & Daley, G. (2006) Teacher recruitment and retention: A review of the recent empirical literature, *Review of Educational Research, 76*(2), 173-208.
- Henry, G.T., Bastian, K.C., Fortner, C.K., Kershaw, D.C., Purtell, K.M., Thompson, C.L., & Zulli, R.A. (2014). Teacher preparation policies and their effects on student achievement. *Education Finance and Policy, 9*(3), 264-303.

References

- Hiebert, J., & Grouws, D. A. (2007). The effects of classroom mathematics teaching on students' learning. In F.K. Lester, Jr., (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 371-404). Charlotte, NC: Information Age Publishing.
- Hill, H.C., Rowan, B., & Ball, D.L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. *American Educational Research Journal, 42*(2), 371-406.
- Jacob, B.A., Kane, T.J., Rockoff, J.E., & Staiger, D.O. (2009). Can you recognize an effective teacher when you recruit one? CLOSUP Working Paper Series No. 11. Ann Arbor, MI: University of Michigan, Center for Local, State, and Urban Policy.
- Kapadia, K., Coca, V., & Easton, J.Q. (2007). *Keeping new teachers: A first look at the influences of induction in the Chicago Public Schools*. Chicago: Consortium on Chicago School Research, University of Chicago.
- Koedel, C., Parson, E., Podgursky, M., & Ehlert, M. (2015). Teacher preparation programs and teacher quality: Are there real differences across programs? *Education Finance and Policy, 10*(4), 508-534.
- Ladd, H.F. (2011). Teachers' perceptions of their working conditions: How predictive of planned and actual teacher movement? *Educational Evaluation and Policy Analysis, 33*(2), 235-261.
- National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel*. Washington, DC: U.S. Department of Education.
- Player, D., Youngs, P., Perrone, F., & Grogan, E. (under review). How fit is associated with teacher mobility and attrition.
- Pogodzinski, B., Youngs, P., & Frank, K. (2013). Collegial climate and novice teachers' intent to remain teaching. *American Journal of Education, 120*(1), 27-54.

References

- Schoenfeld, A.H., Floden, R.E., & the Algebra Teaching Study and Mathematics Assessment Project. (2014). *The TRU Math Scoring Rubric*. Berkeley, CA & East Lansing, MI: Graduate School of Education, University of California, Berkeley and College of Education, Michigan State University.
- Smith, T.M., & Ingersoll, R.M. (2004). Reducing teacher turnover: What are the components of effective induction? *American Educational Research Journal*, 41(3), 681-714.
- Youngs, P., Pogodzinski, B., Grogan, E., & Perrone, F. (2015). Person-organization fit and research on instruction. *Educational Researcher*, 44(1), 37-45.