

# Collaborative Research: Exploring the Impact of Noyce MTF Programs on Teacher Retention: The Role of Motivation, Leadership, and School-Work Environment

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# Overview

Share our research (design and results so far) and stimulate discussions. Each section 5-10 min present 5-10 min Qs feedback, 10-15 min overall discussion

1. Project overview and design
2. Results from the pilot study survey
3. Preliminary results from the main study survey
4. Interviews

# 1. Project Overview

Goal: To study the retention and persistence of MTFs beyond their teaching commitment in comparison with non-MTFs and in relation to their:

- self-efficacy for teaching,
- leadership skills,
- diversity dispositions,
- school-work environment, and
- social networks.

# Research Questions

- How do MTFs and non-MTFs compare in terms of their self-efficacy for teaching, leadership skills, diversity dispositions, social networks, and school-work environment?
- To what extent do MTFs' and non-MTFs' self-efficacy for teaching, leadership skills, diversity dispositions, social networks, and school work-environment relate to their retention?

# Research Questions (cont.)

- What social network characteristics (both teaching and teacher leadership networks) affect teacher retention and persistence?
- What social network characteristics (both teaching and teacher leadership networks) affect leadership activities?
- How do Noyce MTFs' social networks differ from the networks of non-Noyce teachers?
- How do Noyce MTFs' teaching related networks differ from their leadership related networks?

# Project Activities

## Year 1

### Research Design & Recruitment

- Develop & refine research plan, timeline, and logistics
- Contact, reconnect with, and recruit former MTFs
- Identify and recruit comparable non-Noyce teachers
- Develop & refine instruments & data collection infrastructure

## Year 2

### Data Collection

- Survey – Fall 2021
- Interviews – Spring 2022

## Year 3

### Synthesis & Dissemination

### Data Analysis (Y2-Y3)

- Quantitative
- Qualitative
- Social network analysis

- External feedback (AB)
- Consultation

- Virtual group meetings
- Reporting

Completed

Ongoing

Future

# Recruitment for the Pilot Survey

- Rice University School Mathematics Project (RUSMP) teacher network
- Announced in May, closed mid-August
- Two-step: enrollment and survey
- Hiccup with spams due to incentives



# Recruitment

- Collection of demographic and professional background data completed spring 2021
  - 89 of 102 potential MTFs (87% success)
  - 175 potential comparison teachers (about 200 invited)
- Matching MTFs with non-MTFs completed Aug-Sep 2021
  - Based on experience, school-level, degrees, and demographics
- 87 comparison teachers were invited initially

# Survey

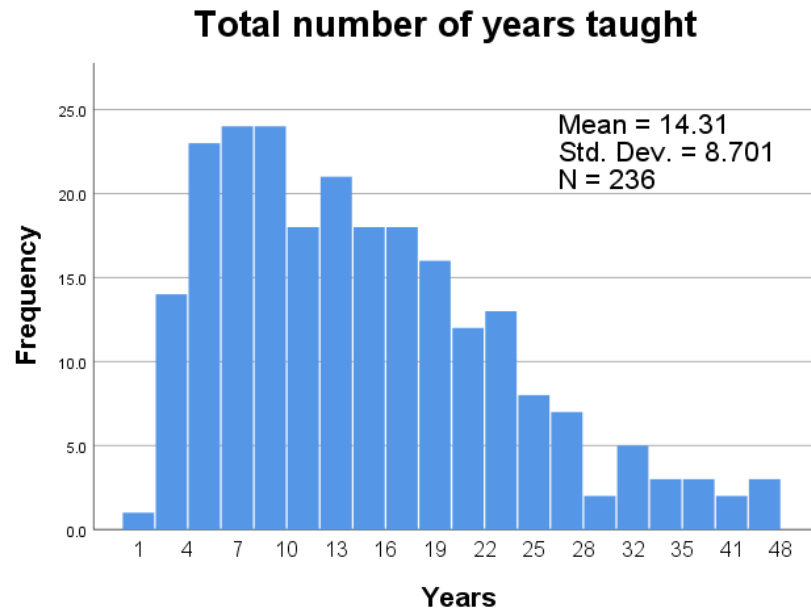
- Three main parts:
  1. Demographic and professional background
  2. Teaching and leadership
  3. Social networks
- Long survey! (45-min to 1 hour)
  - Encouraged multi-sessions
- Incentives:
  - Pilot - \$15 for everyone and seven big prizes totaling to \$1,000
  - Main study - \$175 for everyone

# Q&A and Discussion (Part I)

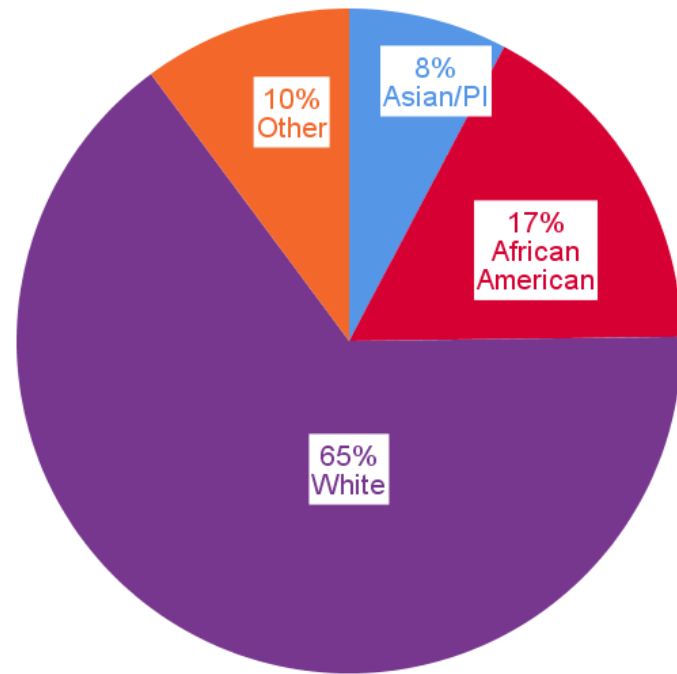
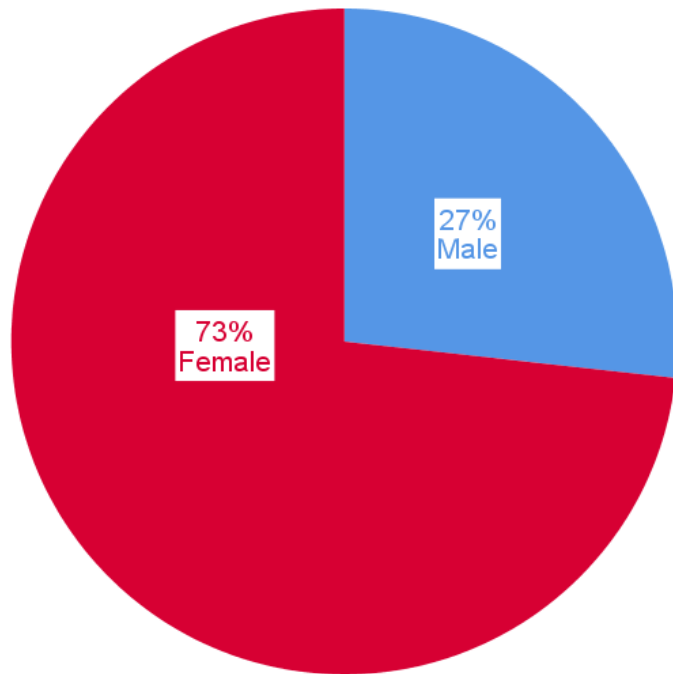
- Questions? Feedback?
- Share your experiences in survey studies with teachers
  - Challenges, tips, etc.
- Discuss advantages and challenges for open-to-public surveys vs. by-invitation surveys
- Discuss different types of questions in surveys (e.g., Likert-scale, open-ended, standardized-response)

## 2. Pilot Survey

- Revalidation of the survey questions and structure for the main study
- Math and science teachers from both elementary and secondary schools in the Greater Houston area

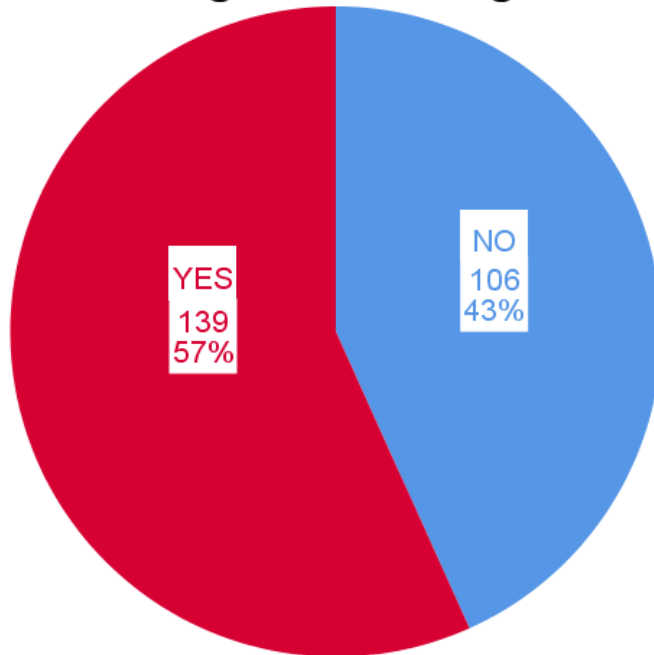


# Demographics

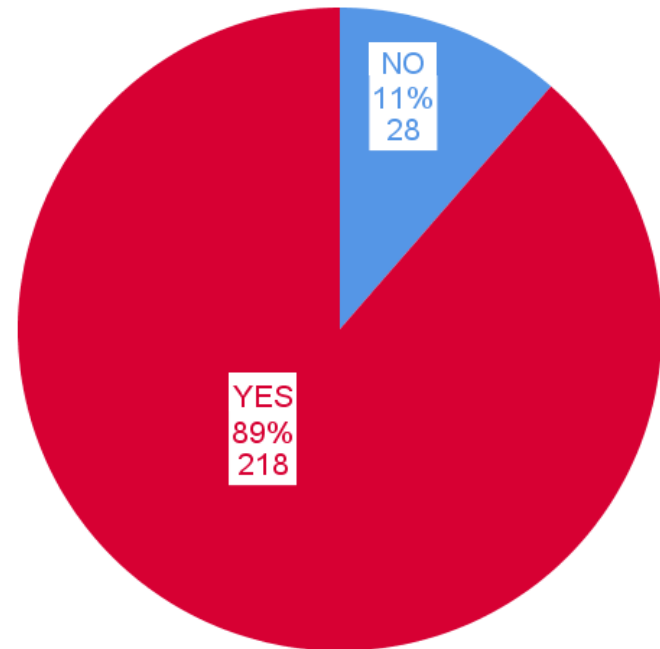


# Professional Background

**Degree in teaching**



**Standard certification**



# Retention

- Stayer: remaining in teaching
- Shifter: accepting a role in education outside of teaching
- Leaver: changing to a non-educational career

# Pilot Results

<b>Retention</b>	<b>B</b>	<b>S.E</b>	<b>Exp(B)</b>
<i>Shifter</i>			
Intercept	-5.27	5.80	
Male	-19.85	0.00	0.00
URM	0.13	0.79	1.14
Standard certification	0.95	1.29	2.58
Degree in teaching subject	-0.88	0.76	0.41
<b>Secondary</b>	<b>1.80</b>	<b>0.87</b>	<b>6.02*</b>
Teaching self-efficacy	0.75	0.76	2.11
<b>Teacher leadership skills</b>	<b>2.30</b>	<b>0.77</b>	<b>10.02**</b>
<b>Person-organization fit</b>	<b>-1.38</b>	<b>0.62</b>	<b>0.25*</b>
Principal autonomy support	0.06	0.38	1.06
Diversity dispositions	-0.78	1.33	0.46
Community connectedness	0.09	0.50	1.09
Social network			
Size	0.01	0.09	1.01
<i>Leaver</i>			
Intercept	-5.90	5.44	
Male	-0.12	0.68	0.89
URM	-1.03	0.90	0.36
Standard certification	-0.68	1.01	0.51
Degree in teaching subject	-0.79	0.62	0.46
Secondary	0.96	0.74	2.62
<b>Teaching self-efficacy</b>	<b>2.52</b>	<b>0.78</b>	<b>12.37**</b>
Teaching leadership skills	-0.44	0.59	0.65
Person-organization fit	-0.38	0.46	0.68
Principal autonomy support	-0.26	0.32	0.77
Diversity dispositions	-0.75	1.21	0.47
Community connectedness	0.15	0.40	1.17
Social network			
Size	0.02	0.09	1.02

a The reference category is: Stayer or Mover.

## **Regression results**

- Secondary teachers more likely to shift to a non-teaching position
- Higher levels of teacher leadership skills associated with shifting to a non-teaching position
- Lower degrees of professional fit within schools associated with shifting
- Higher levels of teaching self-efficacy observed in leavers compared to stayers

## **Reasons for shifting**

- Burnout  
*“I was seeking positions outside of the classroom because of [demanding] teaching.”*
- Better pay
- Greater impact  
*“I felt I could better support students by supporting teachers.”*

## **Reasons for leaving**

- Pandemic, retirement, family, stress, burnout, *“caustic atmosphere”* of school districts



# Q&A and Discussion (Part II)

- Shifting to a non-teaching position
  - Secondary teachers
  - Leadership skills
  - Teacher-school fit
- Reasons for shifting
- Reasons for leaving
- Questions? Feedback?

# 3. Main Survey

- Background questionnaire administered early spring 2021
- Main survey administered October-December, 2021
  - Follow-up background questionnaires
  - Scales for teaching and leadership
  - Social networks
    - Teaching network
    - Teacher leadership network

# Survey Completion

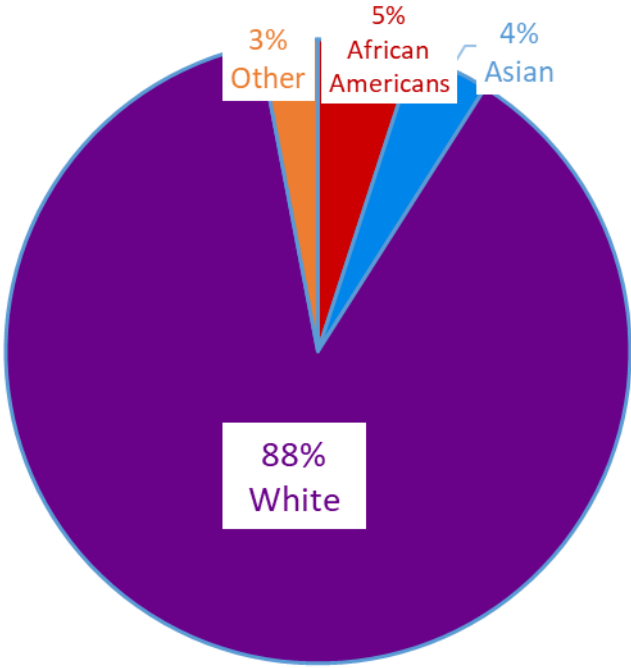
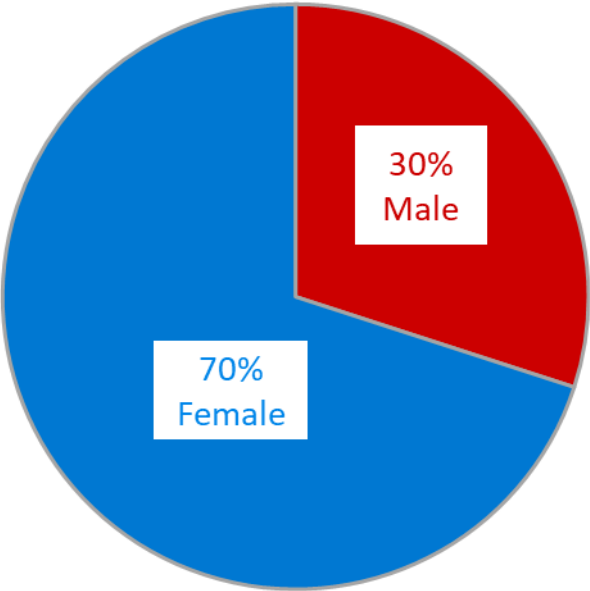
- Administered October-December
- 84 out of 87 MTFs completed (out of 102 original sample; 82% success rate)
- 83 out of 107 total invited comparison teachers completed (78% success rate)

## Role \* retention Crosstabulation

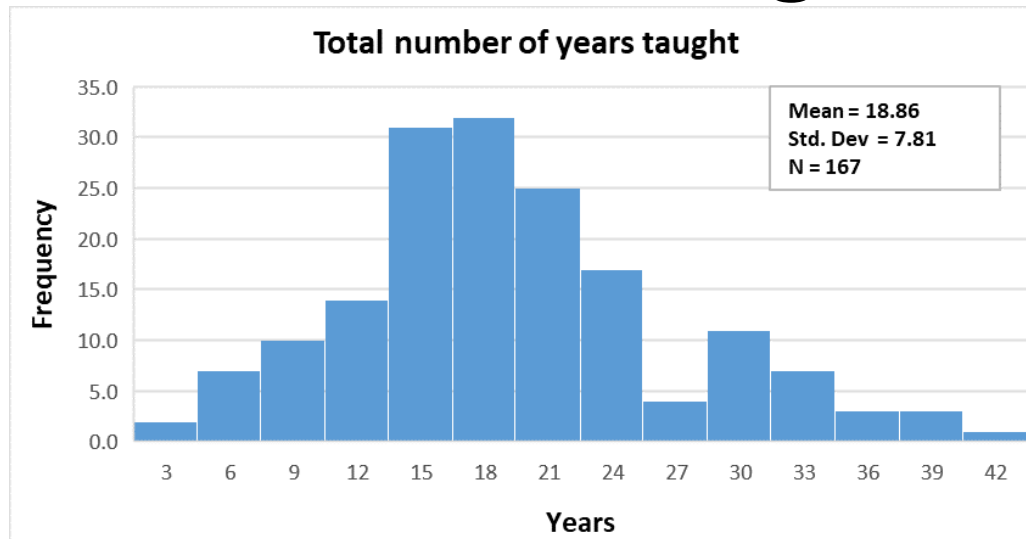
Count

		retention				Total
		stayer	mover	shifter	leaver	
Role	Comparison	62	5	13	3	83
	MTF	42	9	24	9	84
Total		104	14	37	12	167

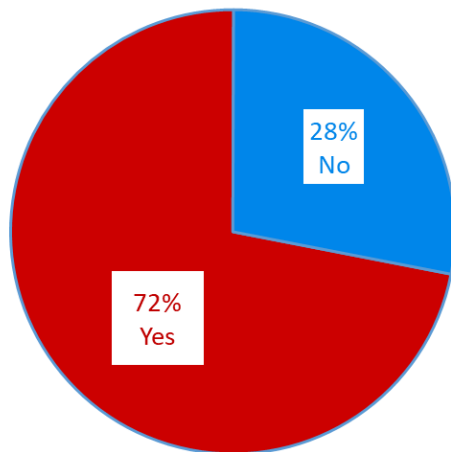
# Demographics



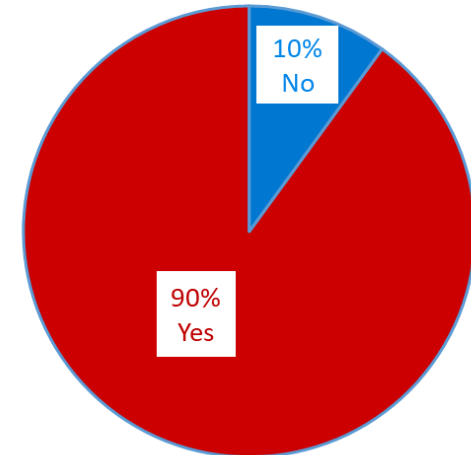
# Professional Background



**DEGREE IN TEACHING**



**STANDARD CERTIFICATION**



# Retention

- Stayer: remaining in teaching
- Mover: changed schools recently
- Shifter: accepting a role in education outside of teaching
- Leaver: changing to a non-educational career

# Main Study Results

<b>Retention</b>	<b>B</b>	<b>S.E</b>	<b>Exp(B)</b>
<i>Mover</i>			
Intercept	-1.44	6.53	
Teaching self-efficacy	0.38	0.63	1.46
Teacher leadership skills	-0.69	0.53	0.50
Person-organization fit	-0.21	0.44	0.81
Principal autonomy support	-0.24	0.34	0.78
Diversity dispositions	0.13	1.70	1.14
Community connectedness	0.04	0.45	1.04
Social network size			
Teacher leadership	-0.07	0.10	0.93
Teaching	0.10	0.08	1.10
<i>Shifter</i>			
Intercept	-1.09	5.74	
Teaching self-efficacy	0.43	0.53	1.54
<b>Teacher leadership skills</b>	<b>1.74</b>	<b>0.52</b>	<b>5.72**</b>
<b>Person-organization fit</b>	<b>-0.77</b>	<b>0.36</b>	<b>0.46*</b>
Principal autonomy support	0.28	0.30	1.32
Diversity dispositions	-1.07	1.38	0.34
Community connectedness	-0.05	0.38	0.95
Social network size			
Teacher leadership	0.10	0.07	1.11
Teaching	0.01	0.06	1.01
<i>Leaver</i>			
Intercept	3.60	9.70	
Teaching self-efficacy	1.98	1.06	7.24
Teacher leadership skills	1.02	0.74	2.77
Person-organization fit	-0.46	0.53	0.63
Principal autonomy support	-0.65	0.38	0.52
Diversity dispositions	-3.53	2.56	0.03
Community connectedness	1.13	0.66	3.09
Social network size			
Teacher leadership	0.19	0.12	1.21
Teaching	-0.17	0.12	0.84

a The reference category is: Stayer.

## *Regression results*

- Movers did not differ from stayers
- Higher levels of teacher leadership skills associated with shifting to a non-teaching position<sup>^</sup>
- Lower degrees of professional fit within schools associated with shifting<sup>^</sup>
- Leavers did not differ from stayers

## *Reasons for shifting*

- Support other teachers  
“To support teachers in reference to curriculum and materials to utilize for instructional purposes.”
- Greater impact<sup>^</sup>
- Evaluations and challenges in teaching  
“Tired of the evaluation procedure as an educator; took too much time from actual teaching.”
- Professional growth

## *Reasons for leaving*

- Family<sup>^</sup>, retirement<sup>^</sup>, pursuing graduate degrees, budget cut, broadening scope of their work “curriculum developer for a non-profit textbook publisher”

<sup>^</sup> similar to pilot results

# Q&A and Discussion (Part III)

- Shifting to a non-teaching position
  - Leadership skills
  - Teacher-school fit
- Reasons for shifting
- Reasons for leaving
- Questions? Feedback?



# 4. Interviews

- Protocols developed in Fall 2021
- Four versions based on retention status
  - Protocol A – Stayer
  - Protocol B – Mover
  - Protocol C – Shifter
  - Protocol D – Leaver
- Two sets of questions based on MTF status
  - Protocol M – MTF
  - Protocol N – Non-MTF

# Pilot Interviews

- Eight pilot interviews conducted in December and January for each possible scenario (4x2, retention-status by MTF-status) with Houston-area teachers except for an MTF-leaver
- Interviews took more than 1 hour
- Protocols revised
  - Some redundant questions eliminated
  - Some questions did not directly relate to research questions
  - Re-ordering of questions (smoother intro and flow)

# Main Interviews

- Interview training completed in early February
- Interviewee selection completed
  - About 40% of survey takers (66 teachers)
  - Selected considering retention-status and MTF-status
- Interviews ongoing: March through May

# Q&A and Discussion (Part IV)

- After the interviews:
  - Transcription (software etc.)
  - Coding
- Future studies
- What do you do after the Noyce MTF grant? (e.g., keeping connections, MTF network, supporting retention)

# Session Feedback

Please take a minute to give us feedback on this session!  
All presenters will be getting feedback from their session

<https://tinyurl.com/wrna22>

Please leave your name at the end to be included in the raffle.

Raffle prizes include Amazon gift cards, STEM Education books, t-shirts, and more